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B.C. Mines, Sept. 07

ANNUAL REPORT
OF THE
MINISTER OF MINES
FOR THE
YEAR ENDING 31st DECEMBER,
1899,
BEING AN ACCOUNT OF
MINING OPERATIONS FOR GOLD, COAL, ETC.,
IN THE
PROVINCE OF BRITISH COLUMBIA.



THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA



VICTORIA, B.C.:
Printed by RICHARD WOLFENDEN, Printer to the Queen's Most Excellent Majesty
1900.

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1899

REPORT
OF THE
MINISTER OF MINES,
1899.

—:O:—


To His Honour THOMAS R. MCINNES,
Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The Annual Report of the Mining Industries of the Province for the year 1899 is herewith respectfully submitted.

SMITH CURTIS,
Minister of Mines.

Minister of Mines' Office,
March 8th, 1900.



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REPORTS

—BY—

WILLIAM FLEET ROBERTSON, PROVINCIAL MINERALOGIST.

—:O:—

*To the Hon. Smith Curtis,
Minister of Mines.*

SIR,—I have the honour to submit herewith my Annual Report on the Mining Industry of the Province for the year ending December 31st, 1899.

The following statistical tables give the total mineral output of the Province to date, and show in considerable detail the actual mineral production of the past year, as based on smelter or mill returns; also a summary of the production of each of the last four years, thus illustrating by comparison the progress made in productive mining during this period.

To facilitate comparison with information previously given, I have retained, as closely as was possible, the general form already established for such tables and for the Report.

I have the honour to be,

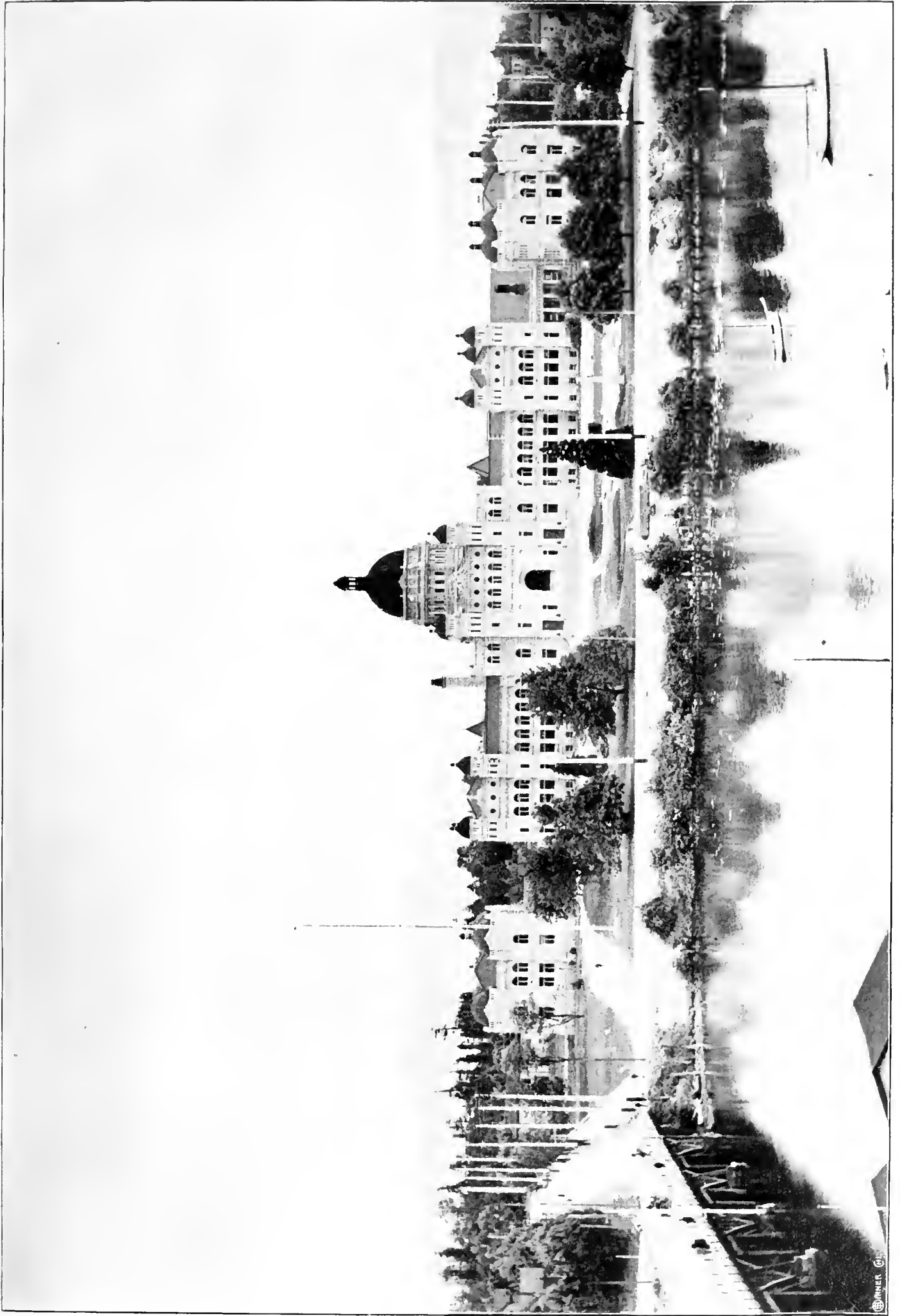
Sir,

Your obedient servant,

WILLIAM FLEET ROBERTSON,

Provincial Mineralogist.

Victoria, B. C., March 5th, 1900.



LEGISLATIVE BUILDINGS AT VICTORIA

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ERRATA.

(FOR CAUSE *see* NOTE, PAGE 828.)

Page 549—	Table I.—Production of Coal,	should read \$ 44,396,387,	not \$ 44,359,811
	Total production to date,	" 135,810,457,	" 135,773,881
	" II.—Production for 1899,	" 12,393,131,	" 12,356,555
" 550	" III.—Production of Coal, 1899,	" (tons) 1,306,324,	" 1,294,132
	Value of same,	" \$ 3,918,972,	" \$ 3,882,396
	Total value production 1899,	" 12,393,131,	" 12,356,555
" 554	" VIII.—Production of Coal, 1899,	" (tons) 1,306,324,	" 1,294,132
	Value of same,	" \$ 3,918,972,	" \$ 3,882,396
	Total production of Coal to date,	" (tons) 14,523,876,	" 14,511,684
	Value of same,	" \$43,953,152,	" \$43,916,576

Page 555—"Progress of Mining," 5th paragraph, should read:—"The total mineral output of the Province for the year 1899 amounts to \$12,393,131, as against \$10,906,861 for the previous year, an increase of \$1,486,270, equivalent to an increase of 13 $\frac{2}{3}$ per cent. over last year."

Page 555—Under "Coal," 1st paragraph should read:—"The coal mines of the Province * * * with an output of 1,306,324 tons of coal * * * an increase in coal production over last year of 170,459 tons * * *."

2nd paragraph should read:—"The Vancouver Island collieries alone * * * with a total output of 1,203,200 tons of coal * * *."

3rd paragraph should read:—"Coal this year again holds the first place in our table of production * * * with a total valuation of \$4,090,727 * * *."

ADDENDA.

SPECIMENS OF PLACER GOLD SENT TO PARIS EXHIBITION.

Since list on page 611 was printed, the following additional specimens have been forwarded, viz. :—

No. 84—	Atlin, from Otter Creek (at Canyon),	gold nugget ; weight, 19.00 oz. ; value, \$250.00	
" 85—	" " " " " " "	1.42 " " "	25.00
" 86—	" " Spruce Ck. (<i>No. 90</i> below),	gold from ledge; " 1.34 " " "	22.10

MINERAL PRODUCTION OF BRITISH COLUMBIA.

:o:

METHOD OF COMPUTING PRODUCTION.

In assembling the output of the lode mines in the following tables, the established custom of this Department has been adhered to, viz. : The output of a mine for the year is considered that amount of ore for which the smelter or mill returns have been received during the year. This system does not give the exact output of the mine for the year, but rather the amounts credited to the mine on the company's books during such year.

For ore shipped in December the smelter returns are not likely to be received until February of the new year, or later, and have, consequently, to be carried over to the credit of such new year. This plan, however, will be found very approximate for each year, and ultimately correct, as ore not credited to one year is included in the next.

In the Lode Mines tables, the amount of the shipments has been obtained from certified returns received from the various mines, as provided for in the "Inspection of Metalliferous Mines Act, 1897." In calculating the values of the products, the average price for the year in the New York Metal Market has been used as a basis. For silver 95 per cent. and for lead 90 per cent. of such market price has been taken. Treatment and other charges have not been deducted.

TABLE I.

TOTAL PRODUCTION FOR ALL YEARS UP TO AND INCLUDING 1899.

Gold, placer	\$ 61,305,719
Gold, lode	9,359,479
Silver	11,340,609
Lead	4,928,069
Copper	2,747,294
Coal and Coke	44,359,811
Building stone, bricks, etc	1,700,000
Other metals	32,900
Total	\$135,773,881

TABLE II.

PRODUCTION FOR EACH YEAR FROM 1890 TO 1899 (INCLUSIVE).

Year.	Amount.
1890	\$ 2,608,803
1891	3,521,102
1892	2,978,530
1893	3,588,413
1894	4,225,717
1895	5,643,042
1896	7,507,956
1897	10,455,268
1898	10,906,861
1899	12,356,555

Table III. gives a statement in detail of the amount and value of the different mineral products for the years 1897, 1898 and 1899. As it has been impossible as yet to collect accurate statistics regarding building stone, lime, bricks, tiles, etc., these are estimated.

TABLE III.
AMOUNT AND VALUE OF MINERAL PRODUCTS FOR 1897, 1898 AND 1899.

	Customary Measure.	1897.		1898.		1899.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Gold, placer	Ounces	25,676	\$ 513,520	32,167	\$ 643,346	67,245	\$ 1,344,900
" lode	"	106,141	2,122,820	110,061	2,201,217	138,315	2,857,573
Silver	"	5,472,971	3,272,836	4,292,401	2,375,841	2,939,413	1,663,708
Copper	Pounds	5,325,180	266,258	7,271,678	874,781	7,722,591	1,351,453
Lead	"	38,841,135	1,390,517	31,693,559	1,077,581	21,862,436	878,870
Coal	Tons, 2,240 lbs	882,854	2,648,562	1,135,865	3,407,595	1,294,132	3,882,396
Coke	" "	17,832	89,155	35,090	175,000	34,251	171,255
Other materials ..	.....		151,600	.....	151,500	.....	206,400
			\$10,455,268		\$10,906,861		\$12,356,555

TABLE IV.
PRODUCTION OF METALS BY DISTRICTS AND DIVISIONS.

NAME.	DIVISIONS.			DISTRICTS.		
	1897.	1898.	1899.	1897.	1898.	1899.
CARIBOO				\$ 325,000	\$ 389,360	\$ 381,900
Barkerville Division	\$ 65,000	\$ 94,500	} 180,000			
Lightning Creek "	25,000	37,000				
Quesnellemouth "	35,000	28,000				
Keithley Creek "	200,000	214,860		193,300		
Omineca (Land Recording Div)..		15,000	8,600			
CASSIAR				37,060	107,300	819,380
KOOTENAY, EAST				163,796	133,368	66,294
KOOTENAY, WEST				6,765,703	6,042,975	6,187,859
Ainsworth Division	440,545	159,801	297,930			
Nelson "	789,215	694,880	879,185			
Slocan "	3,280,686	2,619,852	1,740,372			
Trail Creek "	2,097,280	2,470,811	3,229,086			
Other parts	157,977	97,631	41,286			
LILLOOET				39,840	47,814	69,558
YALE				226,762	432,512	315,865
Osoyoos	142,982	364,112	234,167			
Similkameen	25,100	7,560	6,609			
Yale	58,680	60,840	75,089			
OTHER DISTRICTS				9,390	19,437	255,648
				\$7,567,551	\$7,172,766	\$8,096,504

PLACER GOLD.

Table V. continues the yearly production of placer gold to date, as determined by the returns, sent in by the banks and express companies, of gold transmitted by them to the mints, and from returns sent in by the Gold Commissioners and Mining Recorders. To these yearly amounts, one-third was added up to the year 1878, from then to 1895 and for 1898 and 1899, one-fifth, which proportions are considered to represent, approximately, the amount of gold sold of which there is no record. This placer gold contains from 10 to 25 per cent. silver, but the silver value has not been separated from the totals, as it would be insignificant.

TABLE V.

YIELD OF PLACER GOLD PER YEAR TO DATE.

1858.....	\$ 705,000	1879.....	\$1,290,058
1859.....	1,615,070	1880.....	1,013,827
1860.....	2,228,543	1881.....	1,046,737
1861.....	2,666,118	1882.....	954,085
1862.....	2,656,903	1883.....	794,252
1863.....	3,913,563	1884.....	736,165
1864.....	3,735,850	1885.....	713,738
1865.....	3,491,205	1886.....	903,651
1866.....	2,662,106	1887.....	693,709
1867.....	2,480,868	1888.....	616,731
1868.....	3,372,972	1889.....	588,923
1869.....	1,774,978	1890.....	490,435
1870.....	1,336,956	1891.....	429,811
1871.....	1,799,440	1892.....	399,526
1872.....	1,610,972	1893.....	356,131
1873.....	1,305,749	1894.....	405,516
1874.....	1,844,618	1895.....	481,683
1875.....	2,474,004	1896.....	544,026
1876.....	1,786,648	1897.....	513,520
1877.....	1,608,182	1898.....	643,346
1878.....	1,275,204	1899.....	1,344,900
		Total.....	\$61,305,719

TABLE VI.

The information as to production in the earlier years is obtained from the "Mineral Statistics and Mines for 1896," Geological Survey of Canada.

PRODUCTION OF LODE MINES.

YEAR.	GOLD.		SILVER.		LEAD.		COPPER.		TOTAL VALUES.
	Oz.	Value.	Oz.	Value.	Pounds.	Value.	Pounds.	Value.	
		\$		\$		\$		\$	
1887 ..			17,690	17,331	204,800	9,216			26,547
1888 ..			79,780	75,000	674,500	29,813			104,813
1889 ..			53,192	47,873	165,100	6,498			54,371
1890 ..			70,427	73,948	<i>Nil.</i>	<i>Nil.</i>			73,948
1891 ..			4,500	4,000	<i>Nil.</i>	<i>Nil.</i>			4,000
1892 ..			77,160	66,935	808,420	33,064			99,999
1893 ..	1,170	23,404	227,000	195,000	2,135,023	78,996			297,400
1894 ..	6,252	125,014	746,379	470,219	5,662,523	169,875	324,680	16,234	781,342
1895 ..	39,264	785,271	1,496,522	977,229	16,475,464	532,255	952,840	47,642	2,342,397
1896 ..	62,259	1,244,180	3,135,343	2,100,689	24,199,977	721,384	3,818,556	190,926	4,257,179
1897 ..	106,141	2,122,820	5,472,971	3,272,836	38,841,135	1,390,517	5,325,180	266,258	7,052,431
1898 ..	110,061	2,201,217	4,292,401	2,375,841	31,693,559	1,077,581	7,271,678	874,781	6,529,420
1899 ..	138,315	2,857,573	2,939,413	1,663,708	21,862,436	878,870	7,722,591	1,351,453	6,751,604
Total..	463,462	\$9,359,479	18,612,778	\$11,340,609	142,722,937	\$4,928,069	25,415,525	\$2,747,294	\$28,375,451

TABLE VII.
PRODUCTION IN DETAIL OF THE METALLIFEROUS

DISTRICT.	YEAR	TONS.	GOLD—PLACER.		GOLD—LODE.		SILVER.		COPPER.		
			Ounces	Value.	Ounces.	Value.	Ounces.	Value.	Pounds.	Value.	
				\$		\$		\$			
Cariboo											
Richfield Division ...	1896		9,350	187,009							
	1897		6,250	125,000							
	1898		7,975	159,500							
	1899		9,000	180,000							
Quesnelle "	1896		9,853	197,050							
	1897		10,000	200,000							
	1898		10,743	214,860							
	1899		9,665	193,300							
Omineca "	1898		750	15,000							
	1899		430	8,600							
Cassiar											
Atlin Lake Division ..	1898		3,750	75,000							
	1899		10,000	300,000							
All other Divisions ..	1896		1,050	21,000							
	1897		1,853	37,060							
	1898		1,615	32,300							
	1899		969	19,330							
East Kootenay											
Fort Steele Division ..	1896		1,054	21,076			73,796	49,443			
	1897		2,497	600			116,657	69,760			
	1898		1,971	850			69,780	38,623			
	1899		716	500			33,516	18,970			
Other Divisions	1899		48				1,627	921	397	69	
West Kootenay											
Ainsworth Division ..	1896						374,097	250,665			
	1897		5,556				524,578	313,697			
	1898		1,738				167,147	92,515	203	24	
	1899		3,760		91	1,888	268,165	151,781			
Nelson "	1896		39,160	275	5,500	236	4,720	631,960	423,413	2,237,921	111,896
	1897		50,014			2,076	41,520	961,124	574,752	3,453,644	172,682
	1898		52,762			3,823	76,459	692,367	383,225	1,955,083	235,196
	1899		58,302			16,569	312,308	483,659	273,751	1,370,513	239,810
Slocan "	1896		16,560			152	3,040	1,954,258	1,309,353		
	1897		32,567			193	3,860	3,641,287	2,177,490		
	1898		39,691			60	1,194	3,068,648	1,698,496		
	1899		21,507			11	284	1,891,025	1,070,320		
Trail Creek "	1896		38,075			55,275	1,104,500	89,285	59,830	1,580,635	79,030
	1897		68,804			97,024	1,940,480	110,068	65,821	1,819,586	90,979
	1898		111,282			87,343	1,746,861	170,804	94,539	5,232,011	629,411
	1899		172,665			102,976	2,127,182	185,818	105,173	5,693,839	996,431
All other Divisions ...	1896		58	231	4,627	35	700	11,917	7,985		
(Revelstoke, Trout	1897		1,781	300	6,000	9	189	116,657	69,761		
Lake, Lardeau.)	1898		621	552	11,040	346	6,923	121,510	67,256		
	1899		294	300	6,000	113	2,439	48,463	27,430	1,120	196
Lillooet											
	1896		1,683	33,665							
	1897		755	1,874	37,480	418	2,360				
	1898		900	2,130	42,614	260	5,200				
	1899		1,557	2,135	42,700	1,300	26,353				
Yale											
Osoyoos Division ..	1896					6,561	131,220				
(Grand Forks, Ket-	1897		6,098	440	8,800	6,674	133,480	1,174	702		
tle River.)	1898		14,820	382	7,632	17,824	356,480				
	1899		13,081	180	3,600	11,086	229,028	2,719	4,539		
† Similkameen Div'n.	1896			450	9,000						
(Vernon.)	1897			1,175	23,500						
	1898			378	7,560						
	1899			330	6,600			16	9		
Yale Division	1896			3,255	65,108						
(Ashcroft, Kaml'ps.)	1897			2,934	58,680						
	1898			3,042	60,840						
	1899			538	3,736	71,720	2	45	27	1,700	297
Coast and other Dis-											
tricts (Nanaimo, Al-	1897		290	250	5,000	47	910	1,426	853	51,950	2,597
berni, W. Coast V. I.,	1898		1,159			495	8,100	2,145	1,187	84,381	10,150
Victoria.)	1899		11,901			6,159	127,241	24,352	13,737	651,972	114,620
Miscellaneous	1897										
(building stone, brick,	1898										
etc., other metals, etc)	1899										
TOTALS	1896		27,291	544,926	62,259	1,244,180	3,135,343	2,110,689	3,818,556		190,926
	1897		169,362	25,676	513,520	106,141	2,122,820	5,472,971	3,272,836	5,325,180	266,258
	1898		215,944	32,167	613,346	110,061	2,201,217	4,292,401	2,375,841	7,271,678	874,781
	1899		287,343	67,215	1,341,900	138,315	2,357,573	2,939,413	1,663,703	7,722,591	1,351,453

* Estimated. † 100 oz. Platinum in 1898=\$1,500.

MINES FOR 1896, 1897, 1898, AND 1899.

LEAD.		TOTALS FOR DIVISIONS.				TOTALS FOR DISTRICTS.			
Pounds.	Value.	1896.	1897.	1898.	1899.	1896.	1897.	1898.	1899.
	\$	\$	\$	\$	\$	\$	\$	\$	\$
						384,050	325,000	389,360	381,900
		187,000							
			125,000						
				159,500					
		197,050			130,000				
			200,000						
				214,860					
					193,300				
				15,000					
					8,600				
						21,000	37,060	107,300	819,380
				75,000					
					300,000				
		21,000							
			37,060						
				32,300					
					19,380				
						154,427	163,796	133,368	66,291
2,808,411	83,908	154,427							
2,291,451	82,036		163,796						
2,286,603	77,745			133,368					
881,167	35,423				61,393				
22,653	911				1,901				
						4,002,735	6,765,703	6,042,975	6,187,859
3,186,592	94,961	345,626							
3,543,237	126,843		440,545						
1,978,297	67,262			159,801					
3,588,577	144,261				297,930				
		545,529							
7,291	261		789,215						
				694,880					
579,245	23,286				379,185				
18,175,074	541,618	1,854,011							
30,707,705	1,099,336		3,280,686						
27,063,595	920,162			2,619,852					
16,660,910	669,763				1,740,372				
		1,243,360							
			2,097,289						
				2,470,811					
					3,229,086				
29,900	897	14,209							
2,291,451	82,036		157,977						
365,064	12,412			97,631					
129,884	5,221				41,286				
		33,665				32,665	39,840	47,814	69,558
			39,840						
				47,814					
					69,558				
						206,078	226,762	432,512	315,365
		131,220							
			142,982						
				364,112					
					234,167				
		9,000							
			25,100						
				7,560					
					6,609				
		65,108							
			58,680						
				60,840					
					75,089				
							9,390	19,437	255,648
			9,390						
				19,437					
					255,618				
			150,000				150,000		
				150,000				150,000	
					206,400				206,400
24,199,977	721,384					\$ 4,801,955			
38,841,135	1,390,517						\$ 7,717,551		
31,693,559	1,077,581							\$ 7,322,766	
21,862,436	\$878,870				\$8,302,904				\$8,302,904

** Building stone, etc., \$200,000; Platinum, 55 oz., \$825; Iron ore, 2,071 tons, \$5,575.

TABLE VIII.

COAL AND COKE PRODUCTION PER YEAR TO DATE.

Coal.		
YEARS.	TONS (2,240 lbs)	VALUE.
1836-52	10,000	\$ 40,000
1852-59	25,396	101,592
1859 (2 months)	1,989	7,956
1860	14,246	56,988
1861	13,774	55,096
1862	18,118	72,472
1863	21,345	85,380
1864	28,632	115,528
1865	32,819	131,276
1866	25,115	100,460
1867	31,239	124,956
1868	44,005	176,020
1869	35,802	143,208
1870	29,843	119,372
1871-2-3	148,549	493,836
1874	81,547	244,641
1875	110,145	330,435
1876	139,192	417,576
1877	154,052	462,156
1878	170,846	512,538
1879	241,301	723,903
1880	267,595	802,785
1881	228,357	685,071
1882	282,139	846,417
1883	213,299	639,897
1884	394,070	1,182,210
1885	265,596	796,788
1886	326,636	979,908
1887	413,360	1,240,080
1888	489,301	1,467,903
1889	579,830	1,739,490
1890	678,140	2,034,420
1891	1,029,097	3,087,291
1892	826,335	2,479,005
1893	978,294	2,934,882
1894	1,012,953	3,038,859
1895	939,654	2,818,962
1896	896,222	2,688,666
1897	882,854	2,648,562
1898	1,135,865	3,407,595
1899	1,294,132	3,882,396
Total		14,511,684 tons. \$43,916,576
Coke.		
1895-6	1,565	\$ 7,825
1897	17,831	89,155
1898 (estimated)	35,000	175,000
1899	34,251	171,255
Total		88,647 tons. \$ 443,235

PROGRESS OF MINING.

—o—

In reviewing the progress that has been made in the mining industry of the Province during the past year, in order to fully realize the advance that has been made it is necessary to look at the question from several standpoints.

The first, and probably the most important to the investing public, is the increase that has been made in the actual output of the mines.

This is shown in the preceding tables, and is conclusive evidence of our actual growth, being in a certain sense a measure of the same.

These figures speak for themselves, and they speak the truth as far as they go, but on certain points they are silent. What they leave unsaid requires to be said for them, and possibly they need some interpretation and explanation. They say nothing of the preparations for shipment, of the development work done, nor of the shutting down of many of those mines—for no cause inherent to themselves—which in previous years have been our largest producers.

The total mineral output of the Province for the year 1899, amounts to \$12,356,555, as against \$10,906,861 for the previous year, an increase of \$1,449,694, equivalent to an increase of $13\frac{1}{4}$ per cent. over last year.

This is in itself a very creditable showing, but is much more so when it is taken into consideration that it is made in spite of the fact that the temporary shutting down of certain of the mines caused a deficit of \$910,844 in silver and lead values alone.

There is every reason to believe that but for this shutting down we would have had from these same mines an increase of \$500,000 in place of the present deficit, which would have brought our year's increase to \$2,863,159, or about 27 per cent. over last year.

COAL.

The coal mines of the Province have again this year, as they did last, broken all previous records, with an output of 1,294,132 tons of coal and 34,251 tons of coke, an increase in coal production over last year's of 158,267 tons, with a small decrease of some 750 tons in the production of coke, occasioned by slackness of work at the smelters.

The Vancouver Island Collieries alone broke all the past records, without the assistance of the Crow's Nest Colliery, with a total output of 1,191,008 tons of coal, but the greater part of the coke trade, *i. e.*, some 29,600 tons, has gone to the Crow's Nest, which is so much nearer to the points of consumption as to command the business.

Coal this year again holds the first place in our table of production—if we regard gold placer and lode mining as separate branches of the industry—with a total valuation of \$4,054,151, a large percentage of which represents coal and coke exported.

As a by-product the Wellington Colliery Company, of Union, V. I., produces from its coal mines a very fair quality of fire-clay, for which a good market is found, as it is the only deposit of fire-clay worked on the Coast, and the increasing demand for fire-brick seems to insure a regular and growing market.

The Company has already entered into the manufacture of fire-brick at Union Bay, burning the brick with the waste gases from the coke ovens.

So far, practically, all the output has been used at the Company's various plants.

GOLD.

The gold production for the year 1899—including both placer and lode gold—amounts to the large sum of \$4,202,473, thoroughly substantiating the claim of British Columbia to the title of the Golden Province.

Never before in the history of the Province has the gold production reached the four million mark. The nearest approach thereto was in 1863, when the production was \$3,913,563, and this year consequently leads any previous year by \$288,910.

The yield of placer gold was \$1,344,900, an amount not equalled within
Placer Gold. the last twelve years. This increase is due to the Atlin District, which this year first enters the lists as a serious producer, and, despite the disadvantage of a late first season and innumerable disputes as to the ownership of claims, has yielded about \$800,000 in gold.

Placer mining in other parts of the Province has, on the whole, not been very successful this past year, largely owing to an excessively wet season, which kept the rivers so constantly in flood that but few of them could be worked by the usual placer methods.

Gold obtained by hydraulic mining has been included under placer gold, and forms the chief part of the product of the Cariboo District.

Dredging for gold has not as yet become a factor in the yield. Many companies are at work building and experimenting with different classes of dredges and machinery, but the problem of saving the fine flake gold, which unquestionably exists in the bed of the Fraser and other rivers, is a complicated one and requires time to solve.

The output of gold obtained from lode mining was \$2,857,573, an
Lode Gold. increase over last year of some \$656,356. This increase is due chiefly to the greatly increased tonnage of the Rossland Camp and the operations of the Ymir mines in the Nelson Mining Division.

Lillooet Mining Division this year has also contributed some \$27,000 worth of gold, the product of stamp mills, whereas in the Osoyoos District there has been a decrease of about 30 per cent. from the previous year's production, which is accounted for by the fact that most of the producing mines confined themselves largely to development work, in anticipation of the railway facilities expected in the near future, and the consequent cheapening of freights and supplies.

The production of gold from lode mining has been obtained approximately as follows :

From direct smelting	\$2,166,000
" combined amalgamation and concentrating	600,000
" cyanide process	91,000
	\$2,857,000
Total	\$2,857,000

COPPER.

The amount of fine copper produced in the Province during 1899, was 7,722,591 lbs., an increase of about 6 per cent. over last year. While this increase in the actual output is comparatively slight, the exceedingly good market prices ruling throughout the year caused the value of such production to amount to an increase of about 55 per cent. over that of 1898.

As yet the copper-producing districts are practically limited to three—Rossland, Nelson, and the Coast.

Rossland. Rossland produced about 75 per cent. of our total copper output this past year, with a tonnage of 172,665 tons, an increase of some 55 per cent. over 1898. The increase in the amount of fine copper produced was about 9 per cent., but the increase in the value of such production was about 58 per cent.

Nelson. The copper production of the Nelson Camp fell off this year some 600,000 lbs. in fine copper; however the increase in the market price obtained brought the value of the 1899 product up to about the same as that of 1898.

Coast District. Relatively, the copper production of the Coast District has not as yet reached any very important figure. The output this year was some 654,972 lbs. fine copper, produced from some 5,200 tons of ore, the product of mines on Texada Island, on Mt. Sicker on the east coast, and near Alberni on the west coast of Vancouver Island.

SILVER-LEAD.

While it is a pleasure to note the material increase in other quarters, it is with regret that I have to report so poor a showing from our silver-lead producers, chiefly of the Slocan. If taken as they stand, the statistical figures in themselves are not encouraging as to the growth of the industry, so I feel obliged to offer an explanation of our poor showing in this quarter.

The fact is that many of our largest producers in the Slocan have been shut down, either partially or entirely, for the greater part of the producing year, *i. e.*, since June or July, owing to a question between the owners of the mines and their workmen.

The list of producing mines in the Slocan has altered very little since last year, a few new names only appearing on the list. But the total yearly tonnage of the District has dropped from 30,691 tons in 1898 to 21,507 tons in 1899, according to the returns of ore treated or shipped. The tonnage of ore actually mined in 1899 would be somewhat less, as some of the mines having concentrators utilized the period of enforced idleness underground in running through their mills dumps of second grade ore which had accumulated, which has helped to swell the tonnage of ore shipped and accounts for the greater proportionate decrease in the silver and lead contents of the ore, there having been no appreciable decrease in the assay value of the ores mined. This decrease in production is in no way attributable to any failure or depreciation in the mines themselves, but solely to the fact that they have been worked only a portion of the year.

The total silver production for the year amounts to 2,939,413 ounces, valued at \$1,663,708, a decrease from the production in 1898 of 1,357,619 ounces fine silver, and of \$712,133.

The total lead production for 1899 amounts to 21,862,436 lbs., valued at \$878,870, as against 31,693,559 lbs., valued at \$1,077,581, for 1898, a decrease of 9,831,123 lbs. of lead, and of \$198,711 in value.

IRON ORE.

Some 2,000 tons of iron ore was mined in the Province last year—near Kamloops and on Texada Island—which was used for fluxing purposes by the smelters.

Whereas several extensive deposits of good iron ore (magnetite) are known to exist, it does not appear that the time has yet come when they can be treated for the manufacture of iron.

PLATINUM.

The returns of platinum produced are very incomplete. It is known that some has been secured at Quesnelle, at North Bend, and other places, of which no record has been obtained. The only return of production we have is from the Similkameen Mining Division, and that is only 55 ounces. It appears that many of the placer miners do not know its value, and throw it away as so much "black sand." I might state that the value of the crude platinum sand, as washed out, will vary from \$12 to \$15 per ounce Troy. It must be further remembered by placer miners that this sand is often highly magnetic, and, consequently, that the magnet will not effect a separation between this and the iron sand.

In confirmation of this statement I would quote from a paper in the Report of the Geological Survey of Canada, by G. C. Hoffman, Chemist to the Survey. Mr. Hoffman investigated a sample of 17.89 grammes of native platinum from Granite Creek, a branch of North Fork of Similkameen. "The ore was separated by means of a magnet into two distinct portions, a non-magnetic and a magnetic; the latter constituted 37.88 per cent., by weight, of the whole." The following analyses were obtained by him on these portions:—

	(1) Non-magnetic.	(2) Magnetic.
Platinum	68.19	78.43
Palladium . . . . .	.26 . . . . .	.09
Rhodium	3.10	1.70
Iridium	1.21	1.04
Osmium . . . . .	. . . . .	. . . . .
Copper	3.09	3.89
Iron	7.87	9.78
Osmiridium	14.62	3.77
Gangue (imbedded chromite)	1.95	1.27
	100.29	99.97

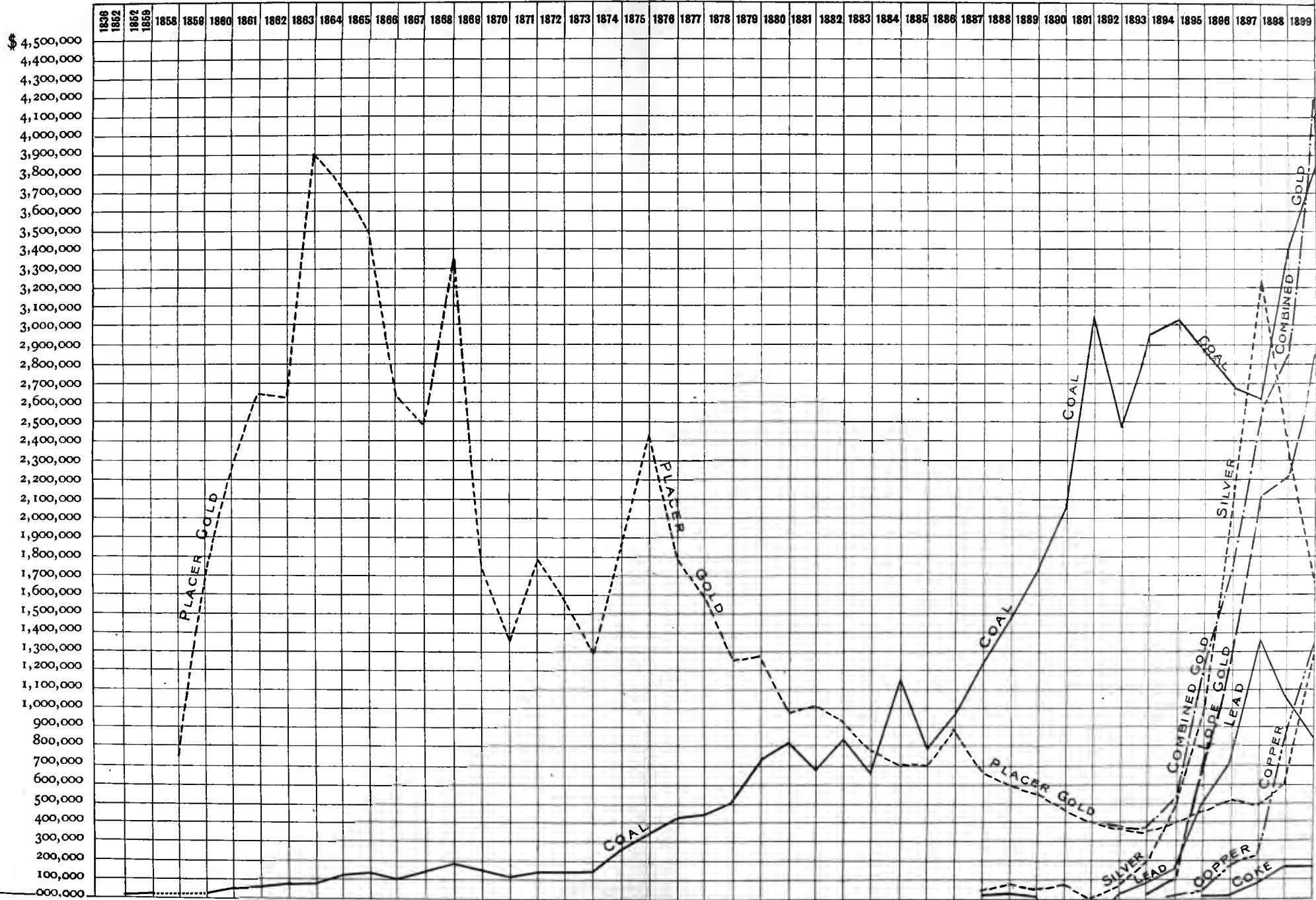
While actual production must be the ultimate measure of the value of a mine or mineral district, still with a Province such as ours only beginning to be developed, where lode mining has been prosecuted for practically less than ten years, and where railways are only commencing to give those transportation facilities necessary for the mining of all except unusually high grade ores, it is not to be expected that production alone will as yet give the full measure of our progress in mining.

This last year there has been an exceedingly large amount of development done in several Districts, notably in Cariboo, the Boundary District, and on the West Coast of Vancouver Island.

For the particulars of such development attention is therefore directed to the detailed reports of the various Districts.



TABLE
SHOWING MINERAL PRODUCTION
 OF
BRITISH COLUMBIA.



 DEPARTMENT OF MINES.

—o—

WORK OF THE YEAR.

Aside from the regular routine of the office, the following is a brief summary of the work of the Department for the year, the details of which are given later:—

After the publication of the Report of the Department for 1898, in the early part of this year, the Provincial Mineralogist was engaged for some two months in preparing for the consideration of the Executive a complete readjustment of the boundaries of the Mining Divisions of the Province, rendered necessary by the growth of the Mining Industry, and with due regard to the altered means of communication.

During the month of May, in conjunction with the Provincial Assayer, he was chiefly occupied in planning, organizing, and carrying out the first of the Examinations for Assayers, as prescribed by Section 2 of the "Bureau of Mines Act Amendment Act, 1899."

The Department of Mines having been intrusted by the Government with the collecting and forwarding of the Mineral Exhibit of the Province to the Paris Universal Exposition, to be held in 1900 in Paris, the Provincial Mineralogist was occupied almost exclusively in this work during the months of June, July and August—being obliged to apply for leave of absence during September for private reasons—so that he was only able to begin to devote his whole attention to the personal examination of the Mining Districts after the first week in October, when he proceeded to the Boundary Creek District, examining the more important developments in the Grand Forks and Kettle River Mining Divisions, later on spending a week in the Rossland Camp, and returning to Victoria during the first week in November.

After attending to such technical work as had accumulated, the second Examination for Assayers was held on November 20th, which occupied, together with the work attached thereto, some two weeks' time.

Final arrangement of matters appertaining to the Paris Exposition, and the preparation of this Report, occupied the rest of the year.

The following is a summary of the work of this office for the past year, as reported by the Provincial Assayer:—

During the year over 800 assays were made, besides a considerable amount of work for other Departments:—

The fees collected were as follows:—

Ordinary assay fees.....	\$ 387 50
Gold bullion fees.....	185 00
Students' fees.....	130 00
Assayers' examination fees.....	260 00
	<hr/>
	\$ 962 50
Value of work done for other Departments and not charged . . .	350 50
	<hr/>
	\$1,313 00

During the summer the Provincial Assayer examined most of the properties on which work had been done in the Alberni and West Coast Vancouver Island Mining Divisions, and on Texada Island, collecting at the same time suitable samples for transmission to the Paris Exposition.

In June the Government opened a branch office in Vancouver for melting gold dust. This branch was placed in charge of Mr. Pellew-Harvey.

Gold melted in Vancouver	\$156,555 00
" " Victoria	62,481 00

Although the arrangements for melting gold dust were not quite completed when the dust began to come in, there has been a large increase in the amount of gold melted, and it is expected, when the facilities for doing such work become better known, that the increase will become much greater.

A number of improvements were made in the laboratory during the past year, with the object of doing quicker and better work as well as for the greater accommodation of students and candidates being examined for the Government Assay Certificate.

A notable improvement is the new gold bullion melting furnace of such a capacity that one thousand ounces can be melted at a time. The plans for this furnace were supplied by the Provincial Mineralogist, and it is fully up to the requirements. A crane has also been erected for the lifting of heavy melts from the furnace, and this insures the pouring of good bars with little risk of mishap.

The qualitative determination of mineral samples is becoming an important feature of the laboratory work, an unusually large number having been done during the past year, for which no charge was made.

The presence of Tellurium seems to be much more general in the Province than was at first supposed. A number of samples containing it were sent in, chiefly from Fire River Valley and Boundary Creek District.

It is important that its presence should be determined, as there is a wide difference in the assay results if, when present, it is not specially provided for. A good flux is the following:—

Ore, .25 assay ton.
Litharge, 2 assay tons.
Soda bi-carb., 1 assay ton.
Argols, $\frac{1}{10}$.
Borax cover.

A number of samples of black sand, from various parts of the Province, were examined for the metals of the platinum group, but, save in one instance, none was found.

The analysis of a sample of crude platinum sand from washings in the Fraser River gave the following result:—

Base metals	6.46 %.
Platinum group	81.30 "
Osmiridium	12.20 "
	99.96 "

Four students availed themselves of the use of the laboratory during the year, and went up for the Assayers' Examination, two passing such Examination and being granted Certificates.

The usual photographic work was done for the Minister of Mines' Report, and a number of photographs were sent to Ottawa for use at the Paris Exposition, including albums in which suitable pictures were mounted.

A large amount of work was done during the past year collecting and forwarding mineral samples to Ottawa for the Paris Exposition, and considerable time was devoted to collecting and arranging the ore specimens in the Provincial Mineral Museum, a large number of such specimens now having been classified according to the Mining Divisions from which they were obtained. Some of the Divisions, however, are very poorly represented, and some not at all. A list showing how such Divisions are represented in the Museum is given below, and it is particularly requested that mine-owners and others assist the Department by sending specimens to fill up such deficiencies:—

Windermere and Golden	well	represented.
Fort Steele	poorly	"
Trail	"	"
Nelson and Goat River	"	"
Arrow Lake	not at all	"
Lardeau	"	"
Trout Lake	poorly	"
Illecillewaet	well	"
Ainsworth	fairly well	"
Slocan	well	"
Grand Forks	not	"
Kettle River	well	"
Similkameen	not	"
Kamloops	"	"
Vernon	"	"
Revelstoke	"	"
Cariboo	poorly	"
Lillooet	"	"
Vancouver Island	well	"
New Westminster and Coast	fairly well	"
Atlin and northern districts	not	"

EXAMINATIONS FOR ASSAYERS.

Numerous complaints were heard last year that many persons throughout the Province, practising as assayers, were not competent to perform such work, that, in consequence thereof, the public was frequently misled by grossly incorrect assays, and that many prospectors and others had been induced by such incorrect assays to spend large amounts of money on prospects that did not warrant such expenditure.

In consequence of these conditions, a demand was made for protection from such unqualified persons, as they not only deceived the public but entered into unfair competition with the great mass of the assayers, who are thoroughly competent and have spent considerable time and money in acquiring their profession. That such protection was thought desirable is evidenced by the passing of an Act known as the "Bureau of Mines Act Amendment Act, 1899," which Act has such an important bearing on the status of assayers in the Province, that it is thought advisable to quote the Act hereinafter, together with an account of such steps as were taken by this Department for the carrying out of the requirements of the same.

That a certain number of such incompetent persons were practising assaying is undoubtedly true, but these examinations will testify that the holder of a certificate under them does

know the business of assaying beyond any question. At the same time the standard will be kept so thoroughly practical that no man who does know his work need have any difficulty in obtaining such Certificate.

Frequently the prospector deceives himself by taking for assay an absolutely incorrect sample of the vein or ore, and when subsequent samplings and assays do not bear out the results he first obtained, is apt to think he has been deceived by the assayer—rather than that he has deceived himself.

So many instances of this sort have been noticed that a few remarks on sampling seem in order and will be found in later pages.

ACT REGARDING EXAMINATIONS.

The following is section 12, chapter 36, of Revised Statutes, as amended by the “Bureau of Mines Act Amendment Act, 1899”:

2. Section 12 of chapter 36 of the Revised Statutes, 1897, is hereby repealed and the following substituted therefor:—

- Examination of assayers. “12. (1.) The Minister shall, twice or oftener in each year, institute an examination for efficiency in the practice of assaying and other kindred subjects as may be deemed advisable; the examination shall be conducted by examiners to be appointed by the Minister; each candidate shall pay, before the examination, such fee as may be determined by the Lieutenant-Governor in Council, who shall grant a certificate of efficiency to each successful candidate at such examination, on the recommendation of the duly appointed examiners, and the payment of a further fee to be determined by the Lieutenant-Governor in Council, such certificate, and the certificate issued under sub-section (2) hereof, to be taken as *primâ facie* evidence of efficiency in any Court of Law in the Province.
- Fees.
- Certificate of efficiency.
- Certificates to graduates of mining schools in Canada, Great Britain or Ireland. “(2.) Every person applying for a certificate of efficiency, on satisfying the duly appointed examiners that he has passed a course of practical, analytical or assay work in any School of Mines or College in Canada, Great Britain, or Ireland, shall be entitled to receive a certificate of efficiency on the recommendation of the duly appointed examiners, and on payment of a fee to be determined by the Lieutenant-Governor in Council; but it shall rest with the examiners to decide whether such course or examination is equivalent to the examination prescribed by the examiners, and if such examination or course is not, in the opinion of the examiners, sufficiently similar to the examination required by the examiners, the examiners may, in their discretion, require such candidate to pass such further examination as they may deem necessary.
- Examiners entitled to certificates. “(3.) The examiners appointed by the Lieutenant-Governor in Council shall be entitled to receive a certificate of efficiency.
- Rules for conduct of examinations. “(4.) The Lieutenant-Governor in Council may from time to time prescribe rules and regulations for the carrying out of such examinations.
- Two years from first day of March, 1899. “(5.) After the expiration of two years from the first day of March, A.D. 1899, no person not holding a certificate of efficiency as prescribed in sub-

sections (1), (2) and (3) hereof shall, by public advertisement or otherwise, solicit employment as an assayer, or to perform assays, nor shall any such person ask or receive payment for performing any assay, nor shall any such person give a written statement of the result of any assay performed by him: Provided that nothing in this sub-section shall apply to persons who already hold a certificate of efficiency under the examination prescribed by section 12 of the 'Bureau of Mines Act.'

"(6.) Any persons violating the provisions of this section shall be liable to a fine of not less than twenty-five dollars and not exceeding one hundred dollars, for each offence."

In accordance with such Act, and for the proper carrying into effect of the same, the Hon. the Minister of Mines was pleased to make regulations which are set forth in the following notice, which he caused to be inserted in the Official Gazette, under date April 18th, 1899:—

"EXAMINATION FOR ASSAYERS FOR LICENCE TO PRACTICE IN BRITISH COLUMBIA.

"In accordance with section 12 of the Bureau of Mines Act, examinations for efficiency in the practice of assaying will be held in the Laboratory of the Bureau of Mines, Victoria, on May 15th and November 20th, 1899, and on such following days as may be found necessary.

"Additional examinations may be ordered by the Minister of Mines at other places and other times, should a sufficient number of candidates be entered from any district at the same time.

"Examinations will cover the following subjects, and candidates must be prepared to be examined in all of these subjects:—

"(a.) SAMPLING :

"Sampling of ores or furnace products and the reduction and preparation of sample for assay, including also the melting of gold dust and sampling of bar for assay.

"(b.) QUALITATIVE DETERMINATION :

"In ores or furnace products of the following: copper, iron, nickel, antimony, arsenic, and sulphur.

"(c.) QUANTITATIVE DETERMINATION—ASSAYING :

"*Bullion*—Gold bullion, for gold and silver ;

Copper bullion, for copper, gold and silver ;

Lead-copper bullion, for lead, copper, gold and silver.

"*Coal* :

"Determination of moisture, volatile combustible matter, fixed carbon, ash and sulphur.

"*Ores and furnace products* :

"Fire assays—

"Gold, silver and lead, by crucible method ;

"Gold and silver, by scorification method.

"Wet assays—

"Copper, by electrolytic, gravimetric, colorimetric and volumetric (cyanide or other approved) methods ;

"Iron, by volumetric and gravimetric methods ;

"Nickel, by electrolytic method ;

"Lead, lime, zinc, sulphur and silica, by any approved methods.

“ENTRANCE FOR EXAMINATION.

“Entrance for any examination must be made in writing to the Secretary of the Board of Examiners, at least ten days before the date set for beginning of examination, and must be accompanied by the prescribed fee.

“CERTIFICATE.

“A certificate of efficiency in assaying will, upon payment of the prescribed fee, be issued to each successful candidate, which certificate shall be considered as a licence to practise assaying in British Columbia; and notice is hereby given that, after the first day of March, 1901, only those holding such certificate of efficiency or licence will be allowed to act as assayers in this Province, under penalty, as provided by the Act.

“EXEMPTION FROM EXAMINATION.

“In accordance with sub-section (2) of section 12 of the Act, graduates of certain Schools of Mines and Colleges may be exempt from examinations, and may, upon satisfying the examiners, as provided in the Act, receive such certificate of competency or licence, upon payment of the fee therefor (\$15).

“The Lieutenant-Governor in Council has been pleased to approve of the following:—

“FEES.

“The fee to be paid by a candidate upon entering his name for any examination shall be \$10.

“Upon issuance of certificate, a fee of \$15 shall be paid by candidate, successful either by examination or by exemption on account of college diploma.

“EXAMINERS.

“The Examiners shall be :

“The Provincial Mineralogist, who shall act as Chairman of the Board of Examiners ;

“The Provincial Assayer, who shall act as Secretary-Treasurer of Board of Examiners ;

“Mr. Pellew-Harvey, of Vancouver, who shall act as special Examiner for such examinations as may be held on or near the Coast.

“Should the Minister of Mines deem it advisable to hold examinations in other localities, he is authorised to appoint another special Examiner from each such locality, who shall act in conjunction with the Provincial Mineralogist and Provincial Assayer for the conducting of such examination.

“Examiners shall be appointed without salary, but shall be allowed hotel and travelling expenses, when called upon to act as Examiners, and shall be entitled to receive without fee a certificate, as provided in the Act.

“While the Department of Mines will provide all the apparatus and chemicals usually necessary, it will not undertake to provide any special or unusual appliances or chemicals which might be called for, and if a candidate should require such, he will have to provide them at his own expense.

“Candidates must provide themselves with such platinum ware and sets of weights as they may require.

“The Department of Mines will make no charge for the use of chemicals or apparatus, but a candidate will be charged for all breakages or unnecessary loss caused by him.

“J. FRED HUME,

“Minister of Mines.

“Department of Mines,

“Victoria, B. C., April 18th, 1899.”

In conformity with these regulations examinations were held, beginning May 15th and November 20th, respectively, and consisted of three written papers and the actual practical determination of the assay contents of some 15 pulp samples obtained from various smelters, the assays of which had been settled and had already formed the basis of the purchase and sale of lots of ore.

The results and particulars of these examinations will be seen in the Report of the Secretary of the Board of Examiners, which follows:—

REPORT OF SECRETARY OF BOARD OF EXAMINERS.

SIR,—I have the honour to submit this my Report as Secretary of the Board of Examiners for Assayers for Licence to practice in B. C., established under the provisions of the “Bureau of Mines Act Amendment Act, 1899.”

The Board met, arranged the scope of the examinations and laid down rules and regulations for the conducting of the same, adhering closely to what was considered to be the spirit of the Act as well as to the wording of same. At the same time regulations were passed as to exactly what “courses” of study or work, in any School of Mines, as mentioned in the Act, might be accepted as “equivalent to the examination prescribed by the Examiners,” and entitle the holder of certificates for same to exemption from examination under the Act.

All of which regulations were duly approved by the Minister of Mines.

The examinations as arranged, are designed to show only that a candidate knows enough to be thoroughly competent as a practical assayer, little stress being placed upon theory, but practical work being made the chief requirement, so that no practising assayer who knows his work, but may have become a little “rusty” on his theory, need have any trouble in passing such examination.

The examinations held so far have been marked as follows:—

Paper on sampling and preparation of sample for assay	150	marks.
“ dry or furnace assaying, theory and practice	150	“
“ wet or chemical “ “	150	“
Practical determination of more common minerals	50	“
“ assaying of pulp samples, both fire and wet methods	400	“
Manipulation, as showing a practical knowledge of the work	100	“
	1,000	

The scope of the Examination has been laid down in the Gazette notice issued by the Minister of Mines, under date of April 18th, 1899, and is, in the opinion of the Board, sufficient for the present, but it is advised that the standard be gradually raised.

Numerous applications for exemption were received and duly considered. Those accompanied with proper documentary evidence, showing that the applicant had passed a “course” equivalent to that covered by the examination prescribed, were recommended to the Hon. Minister of Mines that he should issue certificates to such applicants.

Examinations were held in the laboratories of the Department of Mines, beginning on May 15th and November 20th, 1899, of which due and sufficient notice was given in the Official Gazette. At the first examination, one candidate only presented himself. He passed a very creditable examination, and it was recommended that a certificate be granted him. At the second examination, some seven candidates were present, of which number four passed such examinations as enabled the Board to recommend them for certificates.

The following is a list of those assayers to whom certificates have, on the recommendation of the Board of Examiners, been granted by the Hon. the Minister of Mines, and all of whom have been duly gazetted in the B. C. Gazette:

LIST OF ASSAYERS HOLDING PROVINCIAL CERTIFICATES OF EFFICIENCY UNDER THE "BUREAU OF MINES ACT AMENDMENT ACT, 1899."

(After March 1st, 1901, only the holders of such certificates may practice assaying in B. C.)

Under section 2, sub-section (1)—Charles John Sim. Victoria.
 Wm. J. Watson Vancouver.
 Geoffrey B. Kitto Victoria.
 Wm. M. Cobeldiek Vancouver.
 Thomas R. Robertson Albert Canyon

Under section 2, sub-section (2)—James McFarlane Vancouver.
 Cecil M. Bryant "
 Ellis Philip Gilman "
 John H. Heal Nelson.
 Charles P. Merrit Grand Forks.
 Horace W. Mussen Nelson.
 Christopher Outhett Kamloops.
 A. A. Watson Vernon.

Under section 2, sub-section (3)—Wm. Pellew-Harvey Vancouver.
 Wm. F. Robertson Victoria.
 Herbert Carmichael Victoria.

PREVIOUSLY ISSUED UNDER THE "BUREAU OF MINES ACT, 1897," SECTION 12.

James B. Thompson Victoria.
 W. J. B. Pinder Atlin.

REMARKS ON ASSAYS AND SAMPLES.

"The assaying of any given parcel of ore is necessarily preceded by the process of 'sampling,' by which we seek to obtain, within the compass of a few ounces, a correct 'representative of the entire quantity of ore, which may vary from a few pounds to several 'thousand tons.'"

"Accurate sampling is quite as essential as accurate assaying, for if the sample does not 'truly represent the lot or mass from which it was taken, the subsequent assay will be 'valueless.

"The assayer or chemist will usually receive the sample already prepared, but as he will 'occasionally be called upon to take his own sample, a knowledge of the art of sampling * * * is essential." †

I preface my remarks by quoting these two well-known writers and practical men to show the stress they put on the matter.

In this Province, the majority of the samples brought to an assayer are taken by the prospector or other interested party, and, as the assay certificates are often used as "documentary evidence" of the value of the property, the assayer should be very careful to state on the face of such certificate exactly from whence he obtained the sample on which the assay was made.

If the assayer sampled the ore himself, he owes it to his client so to state, as it doubles the value of the certificate.

* Peters' Modern Copper Smelting, page 28.

† Furman's Practical Assaying, page 25.

If he did not take the sample himself, he should place the responsibility of the sampling where it belongs by stating who did take it. Without some one known vouching for the correctness of the sample, assay certificates should carry no weight as a document.

This can best be accomplished by the assayer seeing to it that his printed certificate blank is so worded as to cover the desired points, telling the whole story, and protecting him from any after-talk.

A certificate form worded somewhat as follows is suggested:—

“I hereby certify that I have assayed a
sample marked handed me by
..... and said to represent sampled
by and I find such sample to contain:—”

If this is filled in every time, no one feels hurt, and no honest man will object to it.

Before leaving the subject of assay certificates, I must protest against the habit of certain assayers in filling in the value of the ore on the assay certificate, as they do, at the price of the metal in marketable shape delivered in New York. It shows a gross ignorance on the part of the assayer as to the value of the ore here, and often misleads the prospector frightfully.

I have seen, this past summer, assay certificates on which the copper value of a 5 % (wet assay) ore was figured out at 18 cents, equal to \$18 per ton, whereas no smelter in the Province could afford to pay more than about one-third that price.

A good practical rule for the prospector in British Columbia to use in figuring out the approximate value of an sulphide ore—at present market quotations—is as follows:—

Allow \$ 1.25 for every per cent. of copper contained ;

“	.40	“	“	lead	“
“	.50	“	ounce	silver	“
“	20.00	“	“	gold	“

These values are for ore delivered on line of railway. This is not strictly accurate, but is near enough to prevent the prospector being misled by false values placed on assay certificates.

The prospector who has to sample his own claim and wishes to know the truth, naturally asks how he is to do it, and the following remarks are for his benefit, not for the expert—they are only outline directions for following a well-beaten trail—the expert knows many short cuts—but unless one is pretty familiar with the country, it is safest and as quick to stick to the trail.

The two pre-requisites to accurate sampling are common sense and common fairness, or honesty, on the part of the sampler.

In sampling a lead, if the vein-matter is such that it will all have to go for treatment, a section of uniform thickness, right across the whole face of the lead, should be taken for a correct sample. This is not usually possible, so it should be approximated as closely as is possible. Wherever it is practicable, make cuts right across the lead—the bigger and more of them the better. In such places as the face or roof of the tunnel or the side of the shaft, several strips should be cut out. Make no selection, take all that comes out of such cut, taking great care that the cut is uniform in depth and width—a thing not easily done if there is a great difference between the friability of the ore and gangue. In extended exposures make the cuts at regular intervals of say 5, 10 or 20 feet—the closer the better—letting them hit where they may, making no selection.

Take all that come out of these cuts to a convenient place, break it up as fine as practicable and by such means as are available; allow nothing to be added to or taken from sample.

Thoroughly mix the broken sample. This is best done by the old and tried "quartering method," viz.: Select a smooth, level, clean spot—preferably a floor or canvas sheet; proceed to "cone the sample," placing a shovelful of ore in centre of floor, and directly on top of this another shovelful, thus continuing and forming a "cone." The rest of the sample is then placed, shovelful by shovelful, on the very apex of the cone, so that it distributes evenly down all sides radially. When all the sample is in the cone, it should be flattened into a circular pile, with height about $\frac{1}{12}$ its diameter. This is done by scraping the ore from the apex of the cone radially in all directions. Across this circular pile there should be marked two lines at right angles and passing through the centre of pile, so dividing the pile into quarters. Two of these quarters, opposite to each other, are then removed, and the space they occupied carefully swept. The quantity of ore is now reduced to half the original. This operation of coning and quartering is continued until the sample is reduced to such size that it can be carried to the assayer. Any pair of the rejected quarters should also be retained as a check, or in case of mishap to regular sample.

Should the lead being sampled contain a pay streak, which only would be shipped, it is best to sample this paystreak as if it was a separate and distinct lead, carefully noting the width sampled. It must be remembered that the sample only represents that portion of the lead from which it was taken.

Another and quite as satisfactory a method is to sample, by method described, all the rock that comes out of the prospect, or sample the dump, if there is any, by cutting channels through it, on the same principle as in sampling a ledge, and working down the ore taken from such channels to a convenient bulk.

It must always be borne in mind in sampling that there is liable to be a great difference between the lump and fine ore, and, consequently, a due regard must be had to getting the proper proportion of each.

Hand-picked samples are never reliable, and should always be avoided. As an instance of this: The manager of a certain mine on the Coast brought into the Government Laboratory, for close and accurate check on the smelter, a large sample of a shipment of ore. The writer found he had taken "a few lumps out of each sack at random," and advised him to go back, dump every tenth sack, and "quarter down" as described, which he did. Both samples were assayed; the first gave 14% copper, the second gave 5.6% copper. The ore went to the smelter, where it was accurately sampled by experienced samplers, and gave within $\frac{1}{10}$ % copper of second result.

Experienced mining men frequently take hand samples of the particular classes of ore in a mine, have these assayed, and from these results they *estimate* what grade of ore they are mining. This may be correctly done, and it is wonderful how close to the correct assay an experienced man can "guess," but it is uncertain at the best, and dangerous for inexperienced persons to attempt to be guided by such estimates.

Assays cannot be averaged unless one knows the actual weight of the material represented by each assay, and only then by a long calculation, too long to describe here, except briefly. In nine cases out of ten, when the "average assay of a mine" is spoken of it is incorrect, and has usually been obtained by adding up a number of separate assays and dividing the sum by the number of such assays. It is quite correct to take an average sample, have that assayed, and call it the average assay; but this is seldom done. The correct "average assay" may be obtained by the following rule:—Multiply the weight of each lot of ore by the assay of such lot, add the products of such multiplications and divide this sum by the sum of the weights of the various lots of ore; the quotient of such division will be the "average assay" required.

READJUSTMENT OF BOUNDARIES OF MINING DIVISIONS.

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The boundaries of the old Mining Divisions of the Province were a matter of such gradual growth, originating with and dictated by the then existing conditions of the Mining Industry and of the country, that, with the new impetus given to prospecting and mining within the last few years and the new fields opening up to the prospector, these old boundaries were found to be entirely too indefinite to serve the purpose intended.

In many of the old Mining Divisions a boundary was described as a straight line running from a point half-way between two lakes to a certain other point; in other cases it was described as a certain meridian or a parallel of latitude, all of which might be easily laid down on a map and correctly, if any correct map existed; but unfortunately no such general map did exist and is not likely to be made for years to come, as the greater part of the country is still unsurveyed, and from its mountainous character is difficult and expensive to survey. Hence, however satisfactory these boundaries may have appeared on the map, they never agreed on any two maps, for no two were alike, while in the field they were simply impossible; they were never traced on the ground and could not be, except at a prohibitive expense; no one, not even the surveyors, know where they were supposed to run, consequently it was quite impossible for any prospector staking a claim near a supposed boundary, to know in which Mining Record Office he should record it, and as a natural result, the greatest confusion existed regarding such records.

Not only were the boundaries indefinite, but in certain of the Divisions the greatest hardship was caused to the prospector by forcing him to travel to a distant Record Office to record his claim and work, while the Record Office of another Division lay quite near and on the line of travel.

An instance of this may be given: Considerable work was being done on the Omineca River; the legal Record Office for these claims was at Telegraph Creek, Stikine Mining Division, a round trip journey of about three months, while Manson Creek Record Office in the Omineca Mining Division was distant only three day's journey.

In the new Divisions an attempt has been made to correct this as far as was possible, without departing too far from the old boundaries in those Mining Divisions where any large number of claims were recorded.

It was fully realized that such a change as this would temporarily cause some confusion, but the change had to be made from the old system, and the sooner it was done the less trouble would be caused.

In describing the new Mining Divisions, the principle adopted was to define their boundaries by the ground, not by the map, to make the natural features of the country the boundaries.

The greater part of the Province in which mining and prospecting has been carried on, or is likely to be to any extent, is mountainous in the extreme; the valleys form the channels to which the lines of travel and transportation are confined, the crossing of the summits being a matter usually of great difficulty and often of danger; hence the drainage areas come to be the natural divisions.

The drainage areas were found in some instances to be too large to be included in one Mining Division and so had to be again subdivided, while in other instances two or more drainage areas had to be grouped together in one Division as they were too small or at present too unimportant to justify a separate Division each.

The heights of land between the drainage areas were therefore taken as the boundaries. These can always be placed in the field. What prospector is there in the country, accustomed as he is to finding his way among the hills and through the woods, who cannot find what watershed he is on? He may not know the name of the creek into which the water flows but he can describe it accurately and knows where it empties itself, and the chances are he has followed it up from some well-known stream.

Ask any prospector where his claim is and, in nine cases out of ten, he will describe its location as being on the watershed of a certain creek. It is the only way he has of placing it intelligibly to others, or of locating its whereabouts in any Mining Division.

This method of defining the boundaries is not new to the Province, it is old. It has been tried and the trial has proved its effectiveness and led to its adoption. It defined the eastern boundary of the Province, the division between East and West Kootenay, and of most of the Kootenay Mining Divisions.

Under this principle the boundaries of a Division may be accurately defined on the ground and any claim definitely located, though the shape of the Division on the maps may vary with the maps.

While this principle has been the guide and the rule, it has not been followed blindly. Exceptions have been made where special facilities of transportation or other considerations seemed to warrant such variations from the rule.

While there can be little doubt but that the principle adopted is correct, it is quite probable that errors, from lack of detailed information, may have been made in some of the details; yet it is believed that these new Mining Divisions will be found suited to the wants and convenience of the great majority of the people, and it is hoped they will not be altered without as urgent a necessity as caused their adoption.

In certain Divisions there are camps and districts so scattered that it must occur that some of these will be remote from a Recording Office. To meet this, and for the greater convenience of prospectors and others, an Order in Council was passed empowering the Minister of Mines to appoint in such remote districts a Deputy Mining Recorder, who shall be empowered to receive, for transmission only to the Mining Recorder of the Division, such records and moneys as may be offered, giving official receipts for the same.

On these records the Deputy Mining Recorder will indorse the date of receipt and forward them at stated intervals to the Mining Recorder, who will enter them in his books under the date indorsed thereon by the Deputy Mining Recorder.

The office of a Deputy Mining Recorder is designated as a "Sub-Recording Office."

MINING DIVISIONS.

The following is a description, taken from the Official Gazette, of the new Mining Divisions, which came into existence on January 1st, 1900, to which is added the name of the town in which the Recording Office is located. When such town is also the seat of the Gold Commissioner of the District, such fact is denoted by a * placed after the name of the town.

 CASSIAR DISTRICT.

STIKINE RIVER MINING DIVISION.

*R. O., Telegraph Creek.**

Shall comprise such portion of the drainage area of the Stikine River and its tributaries as may lie within this Province, and may be defined as follows:—

Commencing on International Boundary at a point $57\frac{1}{2}^{\circ}$ north latitude and approximately east of Endicot Arm; thence north-easterly following height of land dividing the watershed of Taku River and its tributaries on the north from the watersheds of the Stikine and Dease Rivers and their tributaries, to a point on such height of land between Dease Lake and headwaters of Tanzilla River; thence following the eastern boundary of the watershed of the Stikine River to a point on such height of land, between the headwaters of Stikine and watershed flowing into Babine on the south-east; thence south-westerly along the height of land dividing the drainage area of Stikine River on the north from the drainage area of those streams emptying into the Pacific Ocean south of Cleveland Peninsula; thence following such height of land between watersheds of those streams emptying into Bradford Canal and Borough Bay, to a point where such height of land is cut by the International Boundary; thence north-westerly along such International Boundary to the point of commencement.

LIARD RIVER MINING DIVISION.

R. O., Telegraph Creek. Sub-Office, McDame Creek.*

Shall comprise and include such portions of the drainage areas of the Liard and Hay Rivers as may lie within the boundaries of this Province, and is defined as follows:—

Commencing on the northern boundary of the Province at a point where such boundary cuts the 130° west longitude; thence southerly along the height of land forming eastern boundary of Teslin Lake Mining Division to a point on such boundary between McDame Creek and the headwaters of Tuya River; thence southerly along the height of land dividing watersheds of Stikine and Dease Rivers to a point between Dease Lake and headwaters of Tanzilla River; thence south-easterly along the divide between the drainage areas of the Stikine River on the west and the Black River on the east, continuing along the divide between the drainage areas of the Skeena and Findlay Rivers on the south and the Black River and its tributaries on the north, continuing along the height of land dividing the drainage areas of those streams flowing northerly into the Nelson and Hay Rivers from those flowing southerly into the Peace River, to a point where such divide is cut by the eastern boundary of the Province; thence north along such boundary line to the north-east corner of the Province; thence west along the northern boundary of Province to point of commencement.

TESLIN LAKE MINING DIVISION.

*R. O., Telegraph Creek.**

Commencing at a point where the northern boundary of British Columbia intersects the height of land between Teslin and Atlin Lakes; thence southerly following such height of land to a point between Pike Lake and Katin River; thence south-west to the height of land between Lynn Canal and Taku Inlet; thence following such height of land southerly to its intersection with the International Boundary; thence south-easterly following such International Boundary to a point $57\frac{1}{2}^{\circ}$ north latitude and approximately east of Endicot Arm; thence north-easterly following the height of land between the drainage area of the Stikine

and Taku Rivers, continuing north-easterly following the height of land to the northern boundary line of the Province, where such boundary line intersects the 130° west longitude; thence west along the northern boundary of British Columbia to the point of commencement.

ATLIN DISTRICT.

ATLIN LAKE MINING DIVISION.

*Record Office, Atlin.**

Commencing at a point where the northern boundary of British Columbia intersects the height of land between Teslin and Atlin Lakes; thence south-westerly, following such height of land to a point between Pike Lake and Katin River; thence south-west to the height of land separating the drainage area of Lynn Canal and Taku Arm; thence northerly along such height of land to southern end of Tagish Lake; thence northerly following west shore of Tagish Lake to the northern boundary of the Province; thence east along such boundary to point of commencement.

BENNETT LAKE MINING DIVISION.

R. O., Bennett.

Commencing at a point where the northern boundary of British Columbia intersects the west shore of Tagish Lake; thence southerly, following the west shore of the said lake to its southern extremity; thence southerly along the height of land between Lynn Canal and the Taku River to the International Boundary; thence following the said boundary northerly and westerly to its intersection with the northern boundary of British Columbia; thence east to the point of commencement.

SKEENA DISTRICT.

Gold Commissioner's Office, Victoria.

SKEENA RIVER MINING DIVISION.

R. O., Fort Simpson. Sub-Office, Hazelton.

Starting at a point on height of land between Borough Bay and Bradfield Canal where such height of land is cut by the International Boundary; thence north-easterly, following height of land dividing drainage area of Stikine River on the north from the drainage area of those streams emptying into the Pacific Ocean south of Cleveland Peninsula, to a point where such height of land intersects the height of land separating the watershed of the Stikine River on the west from Black River on the east; thence south-easterly along the divide between the drainage area of the Skeena River and tributaries and Babine Lake on the west from the drainage area of the North Tacla and Stuart Lakes and tributaries on the east, to a point where such height of land intersects the height of land forming the divide between the headwaters of the Beaver River on the north and the Nechaco River and tributaries on the south; thence north-westerly, following the height of land between Beaver River and Babine Lake on the north and Decker Lake on the south; thence south-westerly, following the drainage area of Francois Lake on the south and the tributaries of the Skeena River on the north; thence southerly, following the height of land between the drainage area of Gardner Canal on the west from the drainage area of the Otsabunket Lake and tributaries on the east, to a point on the height of land separating the drainage areas between Gardner Canal and tributaries on

the north and Dean Channel and tributaries on the south; thence south-westerly, following the height of land to a point north of Salmon Bay opposite Oscar Pass; thence through Oscar Pass and Millbank Sound south of Price Island; thence westerly, passing to the south and west of Queen Charlotte Islands; thence northerly through Dixon Entrance, passing south of Prince of Wales Island, following Clarence Straits to Behm Channel; thence through Behm Channel to Borough Bay; thence following the International Boundary to point of commencement.

BELLA COOLA MINING DIVISION.

*R. O., Victoria.**

Starting at a point on Millbank Sound south of Price Island; thence proceeding north-east through Oscar Pass to a point north of Salmon Bay on the mainland; thence northerly, following the drainage areas between Gardner Canal and tributaries on north and Dean Channel and tributaries on south to the height of land at a point where it joins the height of land forming divide separating the drainage area of the Nechaco and Blackwater Rivers on the east from the drainage area of streams emptying into Pacific Ocean between Millbank Sound and Oscar Pass and Seymour Inlet; thence southerly along such height of land to a point where it joins the height of land separating the drainage area of those streams flowing into the Pacific Ocean north of Seymour Inlet from the drainage area of those streams flowing into the Pacific Ocean south of Seymour Inlet; thence south-westerly along such divide to north-east Arm of Seymour Inlet; thence still south-westerly by Seymour Inlet and Slingsby Channel to Queen Charlotte Sound; thence northerly to place of commencement, including all islands adjacent to the mainland.

OMINECA DISTRICT.

OMINECA MINING DIVISION.

R. O., Manson Creek. Sub-Office, Fort St. James. Sub-Office, Fort St. John.*

Shall comprise such portions of the drainage area of the Peace River and its tributaries as may lie within this Province, the drainage area of the Stuart River above its junction with Nechaco River, and the drainage area of the Salmon above its junction with the Fraser River, and may be described as follows:—

Commencing on the eastern boundary of the Province at a point where such boundary crosses the divide separating the drainage area of the Hay River on the north from the drainage area of tributaries of the Peace River on the south; thence westerly along height of land forming divide between the drainage area of the Hay River and tributaries of the Liard River on the north from the drainage area of the tributaries of the Peace River on the south to a point where such height of land intersects the height of land forming the eastern boundary of the drainage area of the Skeena River; thence southerly and easterly on height of land separating drainage area of Skeena on the west from drainage areas of the Omineca and Stuart River and tributaries on the east, to a point where such height of land intersects the height of land forming divide between the drainage area of the Stuart River and tributaries on the north and the drainage area of the Nechaco River on the south; thence along such divide to a crossing of the Stuart River at a point about one mile from where the said Stuart River empties into the Nechaco River; thence easterly along height of land between drainage area of the Nechaco on the south and the Salmon River on north, crossing the Salmon River at a point about one mile from where the said Salmon River empties into the Nechaco River, and still

following the height of land to a point between Summit Lake on the north and the Fraser River on the south; thence northerly and easterly along height of land dividing the drainage area of the Fraser and its tributaries on the south from the drainage area of the Peace River and its tributaries on the north, continuing to a point where the southern boundary of the watershed of the Peace River is cut by the eastern boundary of the Province; thence north along such eastern boundary to point of commencement.

CARIBOO DISTRICT.

CARIBOO MINING DIVISION.

*R. O., Barkerville.**

Shall comprise and include the drainage area of the Fraser River and all its tributaries emptying into it above a point half-way between the mouths of West River and Quesnel River, save and except, 1st, the drainage areas of the Stuart River above its junction with the Nechaco, and of the Salmon River above its junction with the Fraser; 2nd, the drainage areas of Blackwater and Nazco Rivers above their junction; and may be described as follows:—

Starting on the eastern boundary of the Province at a point where such boundary cuts the southern boundary of the watershed of the Peace River and its tributaries; thence proceeding westerly and southerly along the height of land separating the drainage area of the Fraser River and its tributaries on the south from the drainage area of the Peace River and its tributaries on the north, continuing to and crossing the Salmon River at a point about one mile from where the said Salmon River empties into the Nechaco River; thence westerly along height of land dividing the drainage area of the Fraser River below this point and Nechaco below the junction of the Stuart on the south from the drainage area of the Stuart and Salmon Rivers on the north, to a crossing of the Stuart River at a point about one mile from where the said Stuart River empties into the Nechaco River; thence westerly along the height of land separating the drainage area of the Nechaco and tributaries on south from the drainage area of Stuart and Skeena Rivers and tributaries on north, to a point where such height of land intersects the height of land separating the drainage area of the Nechaco and tributaries on east from the drainage area of those streams flowing into Pacific Ocean south of Douglas Channel on west; thence southerly along such height of land to a point where it joins the height of land separating the drainage area of Nechaco River on north from drainage area of Upper Blackwater on south; thence easterly along such height of land to a point where it joins the height of land separating the drainage area of Upper Blackwater and Euchiniko Rivers; thence easterly along such divide to a crossing of the Blackwater at the junction of the Nazco River; thence easterly along the height of land between West River and Baker's Creek to a crossing of the Fraser at a point half-way between mouths of West and Quesnel Rivers; thence easterly following height of land dividing the drainage area of the Quesnel River and tributaries on the south from the drainage area of the Willow and Cottonwood Rivers on the north, to a point where such height of land intersects the height of land dividing the drainage area of the South Fork of the Upper Fraser from the drainage area of the Canoe River; thence south-east along such divide to the eastern boundary of the Province; thence northerly along such eastern boundary to the point of commencement.



CONSOLIDATED CARIBOO HYDRAULIC MINING CO.'S FLUME.



HYDRAULIC PIT NO. 1—CONSOL. CARIBOO HYD. MIN. CO.



 QUESNEL MINING DIVISION.
R. O., Quesnel Forks.

Commencing at a point on the eastern boundary of the Province at a point where the height of land between Baker and Dawson Creeks meets such boundary; thence south-westerly along such height of land to a crossing of Canoe River just below Foster Creek; thence southerly along the height of land forming the southern boundary of watershed of Foster Creek, to a point where such height of land meets height of land forming the southern boundary of drainage area of North Thompson River and separating it from the watershed of Adams River; thence along this height of land to a crossing of the Thompson River one mile above the junction of the Clearwater; thence along the eastern boundary of the watershed of the Clearwater to a crossing of that river just above the junction of Mahood Creek; thence westerly along height of land dividing the drainage area of Horsefly River on the north from the drainage areas of Bridge and 111-Mile Creeks on the south, crossing the Government Road at 160-Mile House to a crossing of the Fraser River half-way between Buckskin and Meldrum Creeks; thence westerly along height of land separating the drainage area of Chilcotin River and tributaries on the south from the drainage area of the Nazco and Blackwater on the north, to a point where such height of land joins the height of land between these latter rivers and the Salmon River; thence along on such height of land to a point where such height of land meets the height of land forming the northern boundary of the drainage area of the Blackwater River; thence along such height of land to a crossing of the Blackwater at the junction of the Nazco River; thence easterly along height of land between West River and Baker's Creek to a crossing of the Fraser at a point half-way between mouths of West and Quesnel Rivers; thence easterly following height of land dividing the drainage area of the Quesnel River and tributaries on the south from the drainage area of the Willow and Cottonwood Rivers on the north, to a point where such height of land intersects the height of land dividing the drainage area of the South Fork of the Upper Fraser from the drainage area of the Canoe River; thence south-east along such divide to the eastern boundary of the Province; thence southerly along such eastern boundary to point of commencement.

 LILLOOET DISTRICT.

CLINTON MINING DIVISION.

*R. O., Clinton.**

Starting at the junction of Mahood Creek with the Clearwater; thence westerly along height of land dividing the drainage area of Horsefly River on north from the drainage area of Bridge and 111-Mile Creeks on the south, crossing the Government Road at the 160-Mile House to a crossing of the Fraser River half-way between Buckskin and Meldrum Creeks; thence westerly along height of land separating the drainage area of the Nazco and Blackwater Rivers on north from the drainage area of the Chilcotin and its tributaries on the south to a point where such height of land joins the height of land separating the drainage area of the latter rivers from the drainage areas of those rivers flowing into the Pacific Ocean between Howe Sound and Bunker's Channel; thence southerly and easterly along this divide to height of land between Big Creek on the north and Bridge River on the south to a crossing of the Fraser River half-way between Kelly's and Pavilion Creeks; thence easterly along height of land dividing watershed of Pavilion Creek from that of the Bonaparte River, continuing westerly and southerly along the height of land between Hat Creek and Fraser River,

continuing northerly along height of land between the drainage area of Hat Creek and the Thompson River to a crossing of the Bonaparte River at the mouth of Hat Creek ; thence easterly to height of land separating the drainage area of the Bonaparte above this point from the drainage area of the Thompson River, continuing north-easterly along divide between the drainage area of Bridge Creek on the north-west from Thompson River on the south-east to point of commencement at junction of Mahood Creek with the Clearwater.

LILLOOET MINING DIVISION.

R. O. Lillooet.

Starting at the Fraser River at a point half-way between Kelly's and Pavilion Creeks ; thence easterly along height of land dividing watershed of Pavilion Creek from that of the Bonaparte River, continuing westerly and southerly along the height of land between Hat Creek and the Fraser River to a point where such divide meets the southern boundary of watershed of Fountain Creek ; thence westerly to a crossing of the Fraser at a point half-way between Cayoose River and Texas Creek ; thence south-west along the southern boundary of the drainage area of the Cayoose River and Lillooet Lake to the south end of Lillooet Lake ; thence westerly and northerly along the height of land dividing the drainage areas of the Lillooet Lake, Upper Lillooet and Bridge Rivers on the east from the drainage area of those streams where such height of land meets the height of land forming divide between the drainage area of Bridge River on south and Big Creek on north ; thence easterly along such divide to the point of commencement.

KAMLOOPS DISTRICT.

KAMLOOPS MINING DIVISION.

R. O. Kamloops. Sub-Office, Nicola.*

Commencing at a point on Canoe River at just below mouth of Foster Creek ; thence southerly along height of land forming the southern boundary of watershed of Foster Creek, to a point where such height of land meets height of land forming the south-east boundary of the drainage area of the North Thompson, and separating it from the watershed of Adams River ; thence along this height of land to a crossing of the Thompson River, one mile above the junction of the Clearwater River ; thence along the eastern boundary of the watershed of the Clearwater to a crossing of that river just below the junction of Mahood Creek ; thence south-westerly along divide between drainage areas of Bridge Creek on the north-west, and North Thompson River on south-east ; thence southerly along height of land separating drainage area of Criss Creek on the west and Copper Creek on the east crossing the Thompson River at the outlet of Kamloops Lake ; thence southerly following the height of land between Thompson River on west, and Guichon Creek on east until a point on the Nicola River is reached south of Agate Creek ; thence following Nicola River and Lake to its northern extremity ; thence easterly following height of land between Chapperon and Salmon Lakes, continuing easterly to the Spallumcheen River at Enderby ; thence following Spallumcheen River to north end of Mabel Lake ; thence easterly following height of land separating drainage area of Spallumcheen on south, and Eagle River on north to a point where such height of land intersects the height of land separating the drainage area of Columbia River on east from drainage area of Thompson River and tributaries on west ; thence northerly following such height of land to point of commencement.

ASHCROFT MINING DIVISION.

R. O., Ashcroft.

Starting at a point on the height of land south of Bonaparte Lake ; thence southerly following the drainage areas between Criss Creek on the west and Copper Creek on the east, crossing the Thompson River at the outlet of Kamloops Lake ; thence southerly following the height of land between Thompson River on west and Guichon Creek on east until the Nicola River is reached south of Agate Creek ; thence crossing the Nicola River and following the height of land south-westerly, crossing the Fraser River midway between Quoieek Creek and Salmon River ; thence following the height of land between Quoieek Creek on north and Salmon River on south to the height of land forming the divide separating the drainage areas of the Fraser River on east and Lillooet and Cayoose Rivers on west ; thence northerly following the height of land between Fraser River on east and Lillooet and Cayoose Rivers on west, crossing the Fraser River midway between Cayoose River and Texas Creek ; thence following the drainage areas southerly between the Fraser on west and Hat Creek on the east until the southern watershed of Hat Creek is reached ; thence northerly following the height of land between Hat Creek on west and Thompson River on east to a crossing of the Bonaparte River near the mouth of Hat Creek ; thence easterly to the height of land between the drainage areas of the Bonaparte River on the west and Deadman's River on the east ; thence northerly following the watershed between the Bonaparte River on the west and Deadman's River on the east to the height of land south of Young Lake ; thence easterly to point of commencement.

SIMILKAMEEN MINING DIVISION.

R. O., Princeton. Sub-Office, Nicola.

Starting on International Boundary at a point where such boundary intersects height of land separating the drainage area of Skagit River from drainage area of South Similkameen River ; thence northerly along height of land separating the drainage area of the Skagit and Coquihalla Rivers on west from drainage area of Similkameen on east to a point on such divide where it joins the height of land forming the southern and western boundary of drainage area of Coldwater River ; thence continuing northerly following such height of land to the Nicola River ; thence easterly following Nicola River to Nicola Lake to its northern extremity ; thence easterly along height of land between Salmon and Chapperon Lakes to a point where such height of land joins the height of land separating the drainage area of Upper Nicola and Upper Similkameen on west from drainage area of Okanagan Lake on east ; thence southerly along such height of land passing between Chain and Link Lakes to a point where it joins the height of land forming the western boundary of watershed of 20-Mile Creek ; thence southerly along such height of land to a crossing of the Similkameen River one mile above mouth of 20-Mile Creek ; thence still continuing southerly along height of land separating the drainage area of streams flowing into the Similkameen above this point from drainage area of streams flowing in below this point to a point where such height of land is intersected by International Boundary ; thence west along such International Boundary to point of commencement.

YALE MINING DIVISION.

R. O., Yale.

Starting on International Boundary, at a point where such boundary intersects height of land separating the drainage area of Skagit River from drainage area of South Similkameen River ; thence northerly along height of land separating the drainage area of the Skagit and

Coquihalla Rivers on west from drainage area of Similkameen on east to a point on such divide where it joins the height of land forming the southern and western boundary of drainage area of Coldwater River; thence continuing northerly following such height of land to the Nicola River; thence north-westerly following Nicola River to the height of land south of Agate Creek; thence south-westerly following the height of land to a crossing of the Fraser River, midway between Quoieek Creek and Salmon River; thence westerly following the height of land between Quoieek Creek on north and Salmon River on south, to the height of land forming the divide separating the drainage area of the Fraser River on east and Lillooet River and Harrison Lake on west; thence southerly along such height of land to a point where it joins height of land forming the eastern boundary of watershed of Ruby Creek; thence continuing southerly along such eastern boundary to a crossing of the Fraser River at mouth of Ruby Creek; thence southerly to height of land separating drainage area of the Chilliwack River on west from drainage area of Silver Creek and Skagit River on east to the intersection of such height of land by International Boundary; thence east along such International Boundary to point of commencement.

VERNON DISTRICT.

VERNON MINING DIVISION.

*R. O., Vernon.**

Starting on height of land separating drainage area of Kettle River from the drainage area of Okanagan River and Lake, at a point where such is joined by the height of land forming northern boundary of Penticton Creek; thence westerly along such latter height of land to a crossing of Okanagan River at the outlet of Okanagan Lake; thence westerly, following height of land forming north boundary of drainage area of Beaver Creek, and separating it from the drainage area of Trout River on the north, continuing along divide between drainage area of Similkameen River and Okanagan Lake; thence continuing northerly along height of land between drainage area of Okanagan Lake and drainage area of Nicola River and tributaries, passing along height of land between watershed of Salmon and Otter Rivers; thence north-east, following the Spallumcheen River to north end of Mabel Lake; thence north-easterly, following height of land separating drainage area of Spallumcheen River on south from drainage area of Eagle River on north, to a point where such height of land intersects the height of land separating the drainage area of Columbia River on east from drainage area of Spallumcheen and other tributaries on west; thence southerly, following such height of land to a point where it joins the height of land separating drainage areas of Spallumcheen and Kettle Rivers; thence south-westerly along such height of land to a point where it joins the height of land separating the drainage area of Kettle River from the drainage area of Okanagan Lake; thence southerly to point of commencement.

BOUNDARY DISTRICT.

OSOYOOS MINING DIVISION.

*R. O., Fairview.**

Starting on International Boundary at a point where such boundary intersects the height of land separating the drainage area of Kettle River and Okanagan River; thence northerly along such divide to a point where it joins the height of land forming the northern boundary

of watershed of Penticton Creek ; thence westerly along such height of land to a crossing of Okanagan River at outlet of Okanagan Lake ; thence westerly, following the height of land forming northern boundary of drainage area of Beaver Creek and separating it from the drainage area of Trout River and Okanagan River, to a point where such height of land joins the height of land forming the western boundary of watershed of Twenty-Mile Creek ; thence southerly along such height of land to a crossing of the Similkameen River one mile above mouth of Twenty-Mile Creek ; thence still continuing southerly along height of land separating the drainage area of streams flowing into the Similkameen above this point from drainage area of streams flowing in below this point to a point where such height of land is intersected by International Boundary ; thence east along such International Boundary to point of commencement.

KETTLE RIVER MINING DIVISION.

R. O., Greenwood.

Shall comprise that section of country within this Province forming the drainage area of the Kettle River above the point where such river is joined by Fourth July Creek.

Starting on International Boundary at a point where such boundary intersects the height of land separating the drainage area of Kettle River and Okanagan River ; thence northerly along such divide to a point where it joins the height of land separating drainage area of Kettle River from drainage area of Spallumcheen River ; thence easterly along such divide to a point where it joins the height of land separating the drainage area of Kettle River from drainage area of Columbia River ; thence southerly along such divide to a point where it joins the height of land separating the drainage area of North Fork of Kettle River, of Fourth July Creek, and of the main Kettle River, below the point where such creek joins it, from the drainage area of Kettle River above such point on the west ; thence southerly along such height of land to a point where it is intersected by International Boundary ; thence west along such International Boundary to point of commencement.

GRAND FORKS MINING DIVISION.

R. O., Grand Forks.

Shall comprise that section of country within this Province forming the drainage areas of North Fork of Kettle River, of Fourth July Creek, and of main Kettle River below the junction of such creek, and may be described as follows :—

Starting on International Boundary at a point where it intersects the height of land separating drainage area of Sheep Creek on east from the drainage area of Christina Lake and Kettle River on west ; thence northerly along such divide, continuing along height of land separating drainage area of Columbia River on east from the drainage area of North Fork of Kettle River on the west to a point where such height of land joins the height of land separating drainage area of North Fork of Kettle River and of the main Kettle River ; thence southerly, following the divide separating the drainage area of the main Kettle River above Fourth July Creek on west from the drainage areas of main Kettle River below and including such creek and of North Fork of Kettle River on the east, to a point where such height of land intersects the International Boundary ; thence east along such International Boundary to point of commencement.

GOLDEN DISTRICT.

GOLDEN MINING DIVISION.

*R. O., Golden.**

Commencing on the eastern boundary of the Province at a point where such boundary meets the height of land separating the drainage area of the Upper Kootenay River on south from the drainage area of the Kicking Horse River on north; thence south-westerly along height of land between drainage area of the Upper Kootenay and Columbia Rivers to a point where such height of land joins the height of land between Deadman and Washout Creeks; thence westerly on such height of land to the Columbia River, crossing said river to height of land between Bugaboo Creek on north and Salmon River on south; thence westerly to a point where such height of land intersects height of land forming watershed between East and West Kootenay watersheds; thence north on the height of land forming the watershed between the East and West Kootenay watersheds to a point on the Columbia River opposite the mouth of Canoe River; thence following north the Canoe River to a point between Dawson and Baker Creeks; thence following easterly such height of land to the eastern boundary of the Province; thence southerly along eastern boundary of Province to point of commencement.

WINDERMERE MINING DIVISION.

R. O., Windermere.

Commencing on the eastern boundary of the Province at a point where such boundary meets the height of land separating the drainage area of the Upper Kootenay River on south from the drainage area of the Kicking Horse on north; thence south-westerly along height of land between drainage area of Upper Kootenay and Columbia Rivers to a point where such height of land joins the height of land between Deadman and Washout Creeks; thence westerly along such height of land to a crossing of the Columbia River between Bugaboo Creek on north and Salmon River on south; thence westerly along height of land between the drainage area of these creeks to a point where such height of land joins height of land separating the drainage area of Kootenay Lake on west from drainage area of Upper Columbia and Upper Kootenay Rivers on east; thence southerly along such height of land to a point where such height of land joins the height of land between St. Mary's and Skookumchuck Rivers on south and Findlay Creek on the north; thence easterly along such height of land to a crossing of the Kootenay River just below mouth of Findlay Creek; thence easterly along height of land forming divide between drainage area of streams flowing into Kootenay River above mouth of Findlay Creek from the drainage area of streams flowing into Kootenay River below mouth of Findlay Creek to a point where such height of land joins the eastern boundary of the Province; thence north-westerly along such boundary line to point of commencement.

FORT STEELE DISTRICT.

FORT STEELE MINING DIVISION.

R. O., Fort Steele. Sub-Offices, Tobacco Plains, Fernie, and Cranbrook.*

Starting at a point on the International Boundary where such boundary joins the eastern boundary of the Province; thence west along International Boundary to a point where such boundary cuts the height of land separating the drainage areas of the Moyie and Goat Rivers; thence northerly along height of land separating the drainage area of Moyie and Upper

Kootenay River on the east from drainage area of Goat River and Kootenay Lake on the west to a point where such divide joins the height of land separating the drainage area of St. Mary's and Skookumehuck Rivers on south from drainage area of Findlay Creek on the north; thence easterly along such height of land to a crossing of the Kootenay River just below the mouth of Findlay Creek; thence easterly along height of land forming divide separating drainage area of streams flowing into Kootenay River above the mouth of Findlay Creek from the drainage area of streams flowing into Kootenay River below mouth of Findlay Creek to a point where such height of land joins the eastern boundary of the Province; thence south-easterly along such eastern boundary to point of commencement.

REVELSTOKE DISTRICT.

REVELSTOKE MINING DIVISION.

*R. O., Revelstoke.**

Commencing at a point on the Canoe River at the mouth of Foster Creek; thence following Canoe River to its junction with the Columbia River; thence crossing the Columbia at this point, proceeding south-easterly along height of land forming divide between the drainage area of the Columbia above the mouth of Canoe River and of the Columbia below the mouth of Canoe River to a point where such height of land joins the height of land between headwaters of Downie and Carne Creek on north and north branch of Illecillewaet on the south; thence southerly, following height of land forming western boundary of watershed of north branch of Illecillewaet to a crossing of Illecillewaet one mile below junction of north branch; thence southerly, following the height of land forming west boundary of watershed of South River to height of land between Illecillewaet and Fish Rivers; thence south-westerly along this divide to a point where such height of land joins height of land forming the southern boundary of the watershed of Akolkolex Creek; thence continuing south-westerly along such height of land to a crossing of the Columbia River one mile below mouth of Akolkolex Creek; thence west to the height of land forming divide between the drainage area of the Columbia River on east and of the Thompson River and tributaries on west; thence northerly along such height of land to a point where it joins the height of land forming southern boundary of watershed of Foster Creek; thence westerly along such height of land to the mouth of Foster Creek and point of commencement.

ILLECILLEWAET MINING DIVISION.

R. O., Illecillewaet.

Starting on height of land forming boundary between East and West Kootenay at a point where such height of land joins the height of land between headwaters of Downie and Carne Creek on north, and north branch of Illecillewaet River on south; thence southerly, following height of land forming western boundary of watershed of north branch of Illecillewaet River to a crossing of the Illecillewaet one mile below the junction of north branch; thence southerly, following height of land forming south-western boundary of watershed of South River to height of land between Illecillewaet and Fish Rivers; thence south-easterly to a crossing of Fish River one mile below mouth of Battle Creek; thence easterly along height of land forming southern boundary of such creek to a point where it joins the height of land between the Duncan and Fish Rivers; thence northerly along such height of land to the height of land forming boundary between East and West Kootenay; thence northerly along such boundary to point of commencement.

LARDEAU MINING DIVISION.

R. O., Nakusp.

Commencing on the height of land separating drainage area of Fish and Duncan Rivers at a point where such height of land joins the height of land forming south-western boundary of Battle Creek; thence southerly along height of land separating the drainage area of Kootenay Lake on east from drainage area of Arrow Lakes on west, to a point where such height of land joins the height of land forming southern boundary of watershed of Nucillwaet Creek; thence north-westerly, following the height of land north of the Halcyon Hot Springs and south of Nucillwaet Creek to a crossing of Upper Arrow Lake; thence westerly, crossing Upper Arrow Lake and following the northern boundary of watershed of Pingston Creek to a point where such height of land joins the height of land separating the drainage area of Arrow Lake and Columbia River on east from drainage area of Spallumcheen River on west; thence northerly along such height of land to the southern boundary of Revelstoke Mining Division; thence east along such southern boundary to a crossing of Columbia River one mile below mouth of Akolkolex Creek; thence north-easterly, following height of land forming southern boundary of watershed of Akolkolex Creek, to a point where such height of land joins the height of land forming divide between drainage area of Illecillewaet and Fish Rivers; thence continuing north-easterly along such divide to a point where it joins the height of land forming south-western boundary of watershed of South River; thence south-easterly to a crossing of the Fish River one mile below mouth of Battle Creek; thence continuing south-easterly along height of land forming south-western boundary of watershed of Battle Creek to point of commencement.

TROUT LAKE MINING DIVISION.

R. O., Trout Lake.

Starting on the height of land forming divide between Duncan River on the east and Fish River on the west, at a point where such height of land joins the height of land separating the drainage areas of Fish River and Lardo Creek; thence southerly along height of land separating the drainage area of Duncan River on east from the drainage area of Lardo River on west, to a point on such height of land where it joins the height of land forming southern boundary of Luke or Gallop Creek; thence south-westerly along such height of land to a crossing of Lardo River one mile below mouth of Luke or Gallop Creek; continuing south-westerly along southern boundary of watershed of Poplar Creek to the height of land forming divide between drainage area of Kootenay Lake on east and Arrow Lake on west; thence northerly, following height of land separating drainage area of Lardo River and Trout Lake on east from drainage area of Arrow Lake on west; thence continuing north-easterly along height of land between drainage area of Lardo Creek and Fish Rivers to point of commencement.

SLOCAN DISTRICT.

SLOCAN MINING DIVISION.

R. O., New Denver.

Shall comprise the drainage area of all streams flowing into Slocan Lake above a point half-way between 8 and 10-Mile Creeks on the east shore of lake and above a point one-half mile above Indian Creek on west shore of lake, and may be described as follows:

Starting at a point on east shore of Slocan Lake, half-way between 8 and 10-Mile Creeks; thence easterly along height of land between 8 and 10-Mile Creeks to a point where such

height of land joins the height of land forming divide between drainage area of Slocan Lake and Kootenay Lake; thence northerly along such divide to a point where such divide joins the divide between drainage area of Slocan Lake and Upper Arrow Lake; thence southerly along this divide, passing between Box and Summit Lakes to a point where such divide joins height of land forming northern boundary of watershed of Indian Creek to a point on shore of Slocan Lake half mile above mouth of Indian Creek; thence easterly, crossing Slocan Lake to a point half-way between 8 and 10-Mile Creeks to the point of commencement.

SLOCAN CITY MINING DIVISION.

R. O., Slocan City.

Shall comprise that area of country drained by streams flowing into Slocan Lake above (south) of a point half-way between 8 and 10-Mile Creeks on the east shore of lake and above a point one-half mile north of the mouth of Indian Creek, on west shore of lake, and also the drainage area of all streams flowing into Slocan and Little Slocan Rivers above their junction, and may be described as follows:

Starting at the junction of the Slocan and Little Slocan Rivers; thence easterly and northerly, following height of land separating drainage area of Slocan River above this point from drainage area of Kootenay River and Kootenay Outlet to a point where such height of land joins the height of land forming divide between watershed of Slocan River and Kootenay Lake; thence northerly along such height of land to a point where it joins height of land between 10-Mile Creek on south and 8 and 4-Mile Creek on north; thence westerly, following height of land between 8 and 10-Mile Creeks to a crossing of Slocan Lake to a point half a mile above Indian Creek, on west bank of such lake; thence westerly, following northern boundary of watershed of Indian Creek and northern boundary of watershed of Little Slocan River to a point where it joins the height of land separating drainage area of Little Slocan River from drainage area of the Arrow Lake; thence southerly, following such height of land continuing easterly to mouth of Little Slocan River and point of commencement.

NELSON DISTRICT.

NELSON MINING DIVISION.

*R. O., Nelson.**

Commencing on International Boundary at a point where such boundary intersects the Columbia River; thence northerly, following course of such river and of Lower Arrow Lake to a point on west shore of such lake one mile south of Bowman's Creek; thence easterly, crossing Lower Arrow Lake and continuing easterly to the height of land forming divide between drainage area of Arrow Lake and Columbia River on west and Little Slocan River on east; thence easterly along such divide to a crossing of the Slocan River at the junction of the Little Slocan River; thence easterly and northerly, following height of land separating the drainage area of Slocan River above this point from drainage area of Kootenay River and Kootenay Outlet, to a point where it joins the height of land separating the drainage area of Coffee and Kokanee or Yuill Creeks; thence southerly along southern boundary of Coffee Creek to Balfour; thence southerly crossing Kootenay Inlet to Proctor's Point; thence southerly, following height of land between drainage area of Kootenay Lake on east and drainage area of Kootenay Outlet and Salmon River on west to a point where such height of land is cut by International Boundary; thence west along such International Boundary to point of commencement.

GOAT RIVER MINING DIVISION.

R. O., Kuskonook.

Commencing on International Boundary at a point where such boundary intersects the height of land separating the drainage areas of Moyie and Goat Rivers; thence northerly along such height of land separating drainage area of Moyie and Upper Kootenay Rivers on east from the drainage areas of the Goat River and Kootenay Lake on west to a point where such height of land joins the height of land between the drainage areas of Gray's and Crawford Creeks; thence westerly along such height of land to Crawford Bay; thence crossing Kootenay Lake to Proctor's Point; thence southerly following height of land between the drainage area of Kootenay Lake on east and drainage area of Kootenay Outlet and Salmon River on west to the point where such height of land is cut by International Boundary; thence east along such International Boundary Line to point of commencement.

AINSWORTH MINING DIVISION.

R. O., Kaslo. Sub-Offices, Howser and Trout Lake (for Upper Duncan River).

Starting on the height of land forming divide separating watershed of Kootenay River on east from Kootenay Lake on the west at a point where such divide is joined by the height of land between drainage area of Gray's and Crawford Creeks; thence northerly, following divide separating the drainage area of Kootenay and Upper Columbia Rivers on east from drainage area of those rivers emptying in Kootenay Lake on west to a point on such divide where it joins the height of land between drainage areas of Beaver Creek on the north and the Duncan River on the south; thence southerly, following the divide between the drainage areas of the Duncan River on the east and Fish River and Trout Lake on the west to a point where it joins the height of land forming southern boundary of Luke or Gallop Creek; thence along such height of land to a crossing of Lardo River one mile below mouth of Luke or Gallop Creek; continuing westerly along southern boundary of watershed of Poplar Creek to the height of land forming divide between drainage area of Kootenay Lake on east and Slovan Lake on west; thence southerly along such divide to a point on such height of land where it joins the height of land between drainage areas of Coffee and Kokanee Creeks; thence along southern watershed of Coffee Creek to Balfour; thence crossing Kootenay Lake to Crawford Bay to a point on east shore of such latter between Gray's and Crawford Creeks; thence following height of land between such creeks to point of commencement.

ARROW LAKE MINING DIVISION.

R. O., Nakusp.

Shall comprise that section of country comprising the drainage area of streams flowing into the Arrow Lakes from and including Pingston Creek on the north down to and including Bowman Creek on the south, and may be described as follows:—

Commencing on the divide between Upper Arrow Lake and Lardo River at a point where such height of land joins the height of land forming the southern boundary of watershed of Kooskanax River; thence north-westerly following the height of land north of the Halcyon Hot Springs and south of Nucillwaet Creek to a crossing of Upper Arrow Lake; thence still westerly following northern boundary of watershed of Pingston Creek to the height of land forming divide separating drainage areas of Spallumcheen and Kettle Rivers on west from the drainage area of Arrow Lake on east; thence southerly following such height of land to a point where such height of land joins the height of land forming southern boundary of watershed of Bowman Creek; thence easterly along such height of land to a point one mile south of mouth of Bowman Creek; thence east, crossing Arrow Lake and continuing to the height of land forming divide between drainage areas of Arrow Lake on west and Little Slovan and Slovan

River on east; thence northerly and easterly along such divide to a point where it joins the height of land dividing drainage area of Arrow Lake on west from Kootenay Lake on east to point of commencement.

ROSSLAND DISTRICT.

TRAIL CREEK MINING DIVISION.

*R. O., Rossland.**

Commencing at a point on the Columbia River at International Boundary; thence northerly following course of such river and of Lower Arrow Lake to a point on the west shore of such lake one mile south of Bowman's Creek; thence westerly following height of land forming southern boundary of watershed of Bowman's Creek to a point where such height of land joins the height of land forming divide between drainage areas of Columbia River on the east and drainage area of Kettle River and its tributaries on the west; thence southerly along such divide to a point where it joins the height of land separating the drainage area of Sheep Creek from drainage area of Christina Lake; thence still southerly following such height of land to its point of intersection with International Boundary; thence east along such International Boundary to point of commencement.

NANAIMO DISTRICT.

NANAIMO MINING DIVISION.

*R. O., Nanaimo.**

Commencing at the north end of Lanz Island; thence easterly through Slingsby Channel and Seymour Inlet to North Arm of Seymour Inlet; thence north and east following the height of land forming the watershed of all rivers flowing into the Pacific Ocean south of Seymour Inlet from those flowing into the Pacific Ocean north of Seymour Inlet to the height of land forming the drainage area between those rivers flowing into the Pacific Ocean from those flowing easterly; thence southerly following the height of land forming the drainage area between all those rivers flowing into the Pacific Ocean south of Seymour Inlet and north of Hotham Sound on the west from the drainage area of the Chilcotin, Chilco River and Lake, Jervis Inlet and tributaries on the east; thence following Hotham Sound, Thunder Bay, Malaspina Straits, Straits of Georgia, passing to south of Valdez and Kuper Islands to the north boundary of Chemainus District; thence west along this same boundary to height of land forming the watershed between Nanaimo and Cowichan Rivers; thence following the height of land on Vancouver Island forming the divide between eastern and western watersheds of such island to Cape Scott, and thence to point of commencement.

ALBERNI DISTRICT.

ALBERNI MINING DIVISION.

*R. O., Alberni.**

Commencing at Amphitrite Point; thence northerly along height of land separating drainage area of those streams emptying into Pacific Ocean north of such point from the drainage area of those streams emptying into Barclay Sound, following such height of land

to a point where such height of land joins the height of land separating drainage area of streams emptying into Pacific Ocean on west from drainage area of streams emptying into Straits of Georgia on east; thence southerly along such height of land to a point where it joins the height of land separating drainage area of Nitinat River and Lake on east from drainage area of those streams flowing into Alberni Canal and Barclay Sound on the west; thence south-westerly along such height of land to Pacific Ocean; thence by Pacific Ocean, including Coast Islands, to Amphitrite Point and point of commencement.

WEST COAST VANCOUVER ISLAND MINING DIVISION.

R. O., Clayoquot.

Commencing at Amphitrite Point; thence northerly along height of land separating drainage area of those streams emptying into Pacific Ocean north of such point from drainage area of those streams emptying into Barclay Sound, following such height of land to a point where it joins the height of land separating drainage area of those streams emptying into Pacific Ocean on west from drainage area of streams emptying into Straits of Georgia on east; thence north-westerly along such divide to Cape Scott; thence by Pacific Ocean, including all Coast Islands, to point of commencement.

VICTORIA DISTRICT.

VICTORIA MINING DIVISION.

*R. O., Victoria.**

Commencing at a point in Portier's Pass between Valdes and Galiano Islands; thence south-westerly, passing to south of Kuper Island to the northern boundary of the Chemainus Land Recording Division; thence west along such northern boundary to a point where it intersects the height of land separating the drainage area of Cowichan Lake from drainage area of Nanaimo River; thence north-westerly along such height of land to a point where it joins the height of land separating the drainage area of the Nitinat River and Lake on east from drainage area of those streams flowing into Alberni Canal and Barclay Sound on west; thence south-westerly along such height of land to the Pacific Ocean; thence by Straits of San Juan de Fuca, Haro Straits, Gulf of Georgia, to point of commencement.

NEW WESTMINSTER MINING DIVISION.

R. O., New Westminster; Sub-Offices, Vancouver and Harrison Lake.

Starting on International Boundary at a point where it intersects the height of land separating the drainage area of Chilliwack and Skagit Rivers; thence west along such International Boundary to Straits of Georgia; thence northerly by Straits of Georgia and Malaspina Straits, Thunder Bay and Hotham Sound to the northern end of Hotham Sound; thence northerly along height of land separating the drainage area of streams flowing into Jervis Inlet on east from drainage area of streams emptying into Pacific Ocean north of Jervis Inlet on the west to a point where such height of land joins the height of land separating the drainage area of Chilco River and Lake on north from drainage area of streams flowing into Jervis Inlet on south; thence easterly along such height of land to a point where it joins the height of land separating the drainage area of Bridge River and Lillooet Lake and River on east from drainage area of streams emptying into Jervis Inlet and Howe Sound on west; thence southerly and easterly along such divide to a point at south end of Lillooet Lake;

thence easterly to height of land separating the drainage area of Lillooet River and Harrison Lake on west from drainage area of Fraser River on east ; thence southerly along such height of land to a point where it joins height of land forming the eastern boundary of watershed of Ruby Creek ; thence continuing southerly along such eastern boundary to a crossing of Fraser River at mouth of Ruby Creek ; thence southerly to height of land separating drainage area of the Chilliwack River on west from drainage area of Silver Creek and Skagit River on east to the intersection of such height of land by International Boundary and point of commencement.

PARIS EXPOSITION, 1900.

PROVINCIAL MINERAL EXHIBIT.

The Legislature, during the Session of 1899, made an appropriation to cover all expenses of collecting and forwarding suitable Provincial exhibits to the Paris Exposition, 1900.

Early in the year enquiries were made as to the possibility of the Province being able to secure space for a separate Provincial exhibit at the Exposition. This was found to be quite out of the question, as the French Commission recognize in Canada only the Dominion Government, and then only as a part of the British Empire, a total space being allotted to the Empire for its use and for distribution among its various members and colonies by the British Commission in London.

The position of the Exposition buildings, in the very heart of the City of Paris, rendered the total amount of available space exceedingly limited, so much so that the space allotted to the British Empire, including all its dependencies, amounted to only 350,000 square feet. Of this total space, the British Commission allotted to Canada about one-eighth, viz. : 40,000 sq. feet—28,000 sq. feet in the Colonial building, and 12,000 in the various Imperial buildings—probably all we are entitled to as our due proportion. This 40,000 sq. feet was all that the Dominion Government was able to obtain, in which to exhibit all the products and industries of the Dominion. As was pointed out by the Dominion Commission, the limited space at its disposal precluded any possibility of allotting separate space to each Province, and the Canadian exhibit would in consequence have to be distinctly a Dominion exhibit, under the control of the Dominion Commission.

In March, Mr. W. D. Scott, one of the Dominion Commissioners, arrived in Victoria, when, for the first time, it was possible to get any definite information relative to the Exposition. From Mr. Scott were obtained the data already given and the further fact that the Canadian Commission had made an approximate sub-division of the space at their command,

the allotments to the various industries being made for the whole Dominion. The spaces allotted to those industries which are of chief interest to this Province are as follows:—

Agriculture, in all its branches.....	7,000 sq. feet.
Food products, including canned goods	4,500 "
Mines, Minerals and Quarries.....	3,000 "
Forestry, including hunting and fishing	2,000 "
Education	1,000 "

Dr. Geo. M. Dawson, of the Geological Survey of Canada, was the Commissioner in charge for the Dominion of the section of Mines, Minerals and Quarries.

The task of collecting, preparing and forwarding to Ottawa the exhibit of the Province for this section was intrusted to this Department, the matter being placed in the hands of the Provincial Mineralogist, who devoted the greater part of the season to work in connection therewith, the following being a report of what was accomplished:—

It was urged by this Department that 3,000 sq. feet was entirely inadequate space for the exhibit of Mines and Minerals of the Dominion, as this Province alone had at the Columbian Exhibition in 1892 some 12,000 sq. feet for this purpose. No more space for this Section could be obtained, however, so what was available had to be made the best use of. The Commission was requested to allot for this Province a definite portion of the 3,000 sq. feet allotted to this Section for the Dominion, the request being made for half the total Dominion space, as we were entitled to such proportionate share, inasmuch as British Columbia's contribution to the mineral wealth of the Dominion amounted to more than that of all the other Provinces combined; and furthermore, that mining being our chief industry entitled us to especial consideration.

In support of such request, the following summary of figures was given, deduced from the Dominion statistics for 1897, the latest then published:—

In 1897 the mines of British Columbia produced the following proportion of the total Dominion output:—Copper, 17 per cent.; Gold, 44 per cent.; Silver, 98 per cent.; Platinum, 100 per cent.; Coal, 36 per cent.; Coke, 50 per cent.

The statistics for 1898 have since become available, and these same comparisons, shown in graphic tabular form, quite as strongly sustain our claim.

TABLE

Showing Comparative Mineral Production for 1898 of British Columbia and Other Provinces of the Dominion.

	Dominion Total.	YUKON TERRITORY.		
Gold	\$10,000,000			
Gold	3,700,000	BRITISH COLUMBIA.	ALL OTHER PROVINCES COMBINED.	\$ 815,437
Silver	2,533,293			207,457
Copper	2,159,556			1,234,775
Lead	1,206,399			128,818
Iron	152,510			152,510
Nickel	1,320,338			1,320,338
Coal	3,227,958			4,320,363
Coke	219,200			44,200
Total		\$10,795,361		\$9,274,398

Such proposed arrangement could not be made, however, it being decided that the whole mineral exhibit of the Dominion would have to be a unit, but that the labels attached to specimens would be of distinctive colours, and indicate by such colours which Province the specimens were from—golden yellow labels being placed on all British Columbian samples, as indicative of our claim to being the “Golden Province.”

As a preliminary, although not quite within the scope of this Department, yet as of general benefit to the Province, application was made to the Dominion Commission to have all the cases, etc., for the mineral exhibit of the Dominion made from British Columbian wood; this was acceded to, upon this Provincial Government agreeing to supply such lumber.

The Provincial Mineralogist was thereupon instructed to procure the necessary lumber, which he did, having it specially cut, dried and prepared from the best selected stock by one of the largest of our lumber companies.

The lumber was duly shipped to Ottawa, where it was declared very suitable, and was ordered to be sent to a kiln for additional drying; something, however, occurred to delay the execution of this order, and here fortune favoured us, since this alone prevented the entire loss of the wood, the kiln being destroyed by fire the next night.

The Provincial Mineralogist then started a round of the mining centres, enlisting the active co-operation and assistance of the various Boards of Trade and mine-owners in the collection of samples of ore representing developed properties.

With such aid, there were gathered together at various centres, and by the Provincial Mineralogist labelled, catalogued, packed and shipped to Ottawa, nearly 600 specimens of ore, representing existing mining properties throughout the Province, a list of which samples is hereto appended.

The size of these samples was limited by the Dominion Commissioner to “cubes of six inches,” but on special application certain larger samples were accepted “provided they were fine specimens and from important properties.”

The collection sent was distinctly a commercial one—the specimens being sent as “*ore samples*” as distinguished from mineral specimens—no attempt being made to exhibit anything not of commercial value.

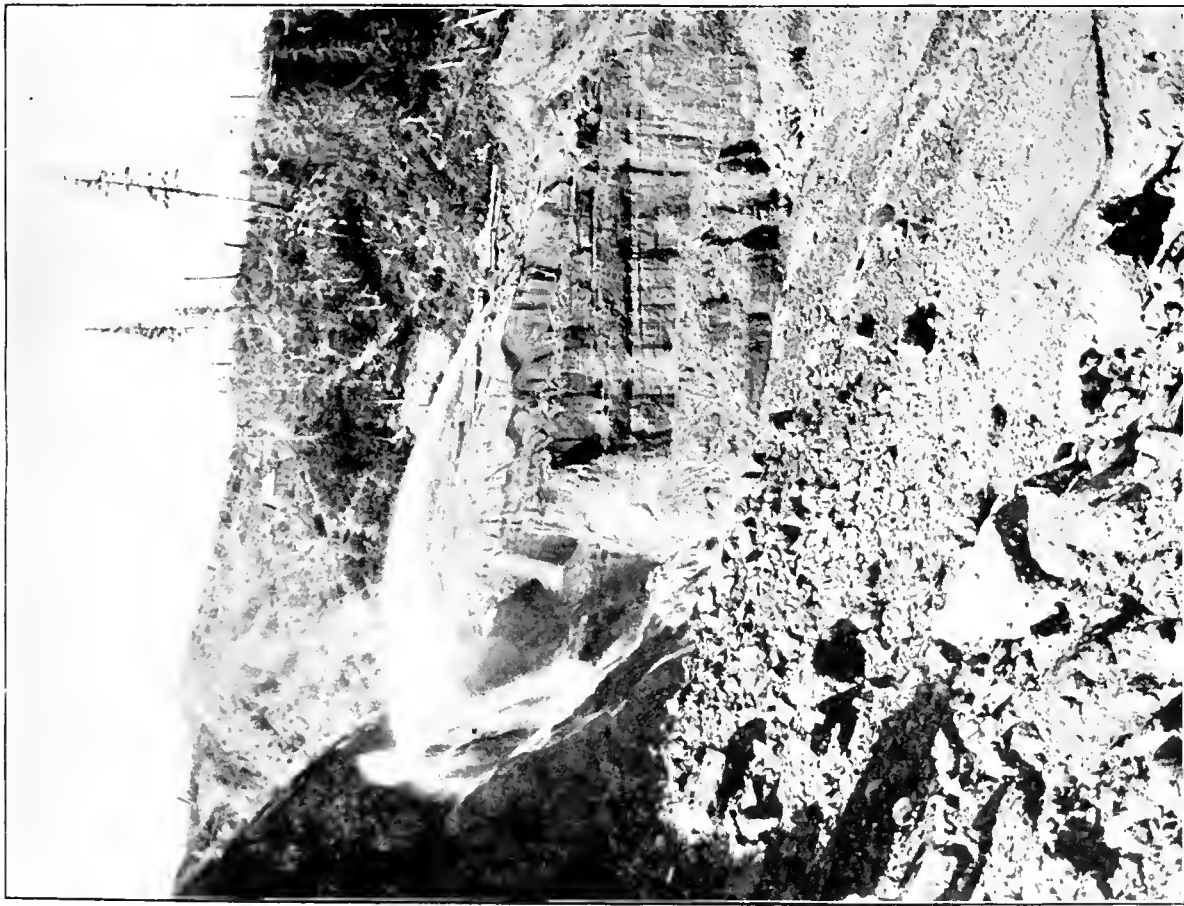
The various collieries in the Province each cut cubes of coal of two feet sides and carefully boxed and shipped the same at their own expense.

Special mention must be made of the kindness of Mr. Buchanan, of the Bank of Montreal in Nelson, who contributed a splendid lot of large specimens of ore he had in his office—several weighing nearly 1,000 pounds each.

Individual acknowledgements cannot be made, but the Provincial Mineralogist wishes to acknowledge the kind assistance of the various Boards of Trade, of the Mining Companies and private individuals in the making of this collection in the very short time allotted, and under very adverse circumstances.

Most of the transportation companies and railways transported specimens free of charge to the centres of collection—notably the Canadian Pacific Railway, which also further indicated its active co-operation by providing free transportation for the Provincial Mineralogist while engaged on such work.

Placer gold specimens, some eighty-five in number—a list of which is hereto appended—were obtained by this Department through the various Gold Commissioners, and by direct application to the Mining Companies, each sample representing a different placer mining locality.



HYDRAULIC WASHING WITH MONITORS—CONSOLIDATED CARIBOO HYDRAULIC MINING CO.

Most of these samples were bought by the Government, but in the instance of Mr. J. B. Hobson, of Quesnel, and of Mr. John Cobeldick, of Lytton, payment was not desired, as they "thought they owed it to the Province to do so much to help the good cause," and acknowledgments to these gentlemen are due not only for their kind encouragement, but for the value of the gold presented, as shown in the list.

This collection of gold dust is to be kept separate as a distinctly Provincial exhibit—this Department having had made for it a special case of steel, covered with heavy plate glass and protected by a steel grating over all.

Photographic views of British Columbia representing the Mines and Mining Districts, with certain other general views—a list of which is hereto appended—were obtained and bound in two separate duplicate albums of special design.

A considerable number of photographic negatives—taken by the Provincial Mineralogist and others—were forwarded to Ottawa for enlargement into transparencies to be used in the windows of the Canadian Exhibit.

Some four bound volumes of the Reports of this Department for 1896-7 and 8, together with some one hundred copies of the ordinary paper binding for each of these years, were sent to Ottawa, and a much larger number of this year's Report was promised when printed; all of which are to be placed in the reference library connected with the Exhibit.

The whole mineral and gold exhibit from British Columbia, it has been stipulated, is to remain the property of this Government, and to be at its disposal at the close of the Paris Exposition.

The exhibit has been so far left in the hands of the Canadian Geological Survey, no one having been appointed to specially represent British Columbia at the Exposition.

SAMPLES OF ORE SENT TO THE PARIS EXHIBITION.

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Cariboo District. Quesnel Mining Division.

*Collected by Geological Survey.

Mine.	Locality.	Approx. Wt.	Owners or Agents.		Particulars—Tonnage or Values Shipped or Amount of Work done.	Assays in		
			Name.	Address.		Cu. %	Pb. %	Ag. oz. Au. \$
*Read Bros.' Claim	Quesnel				Auriferous pyrite			
*B. C. M. & M. Co.	Island Mt.				"			
*Campbell Claim	Burns Mt.				Gold			
*Burns Mt. Claim								

Cassiar District. Skeena Mining Division.

Singlehurst	Skeena River	40	H. Gould, c/o Pellew-Harvey		Bornite	26.2		12.2	\$4
Ptarmigan	Kitsalos Mt.	5		Vancouver	Silver ore			231	\$4

East Kootenay District. Fort Steele Mining Division.

Lottie	Luke Creek	40	— Caldwell		40 ft. shaft and open cuts (3); fair prospect.				
Old Abe	Bull River	5	R. O. Jennings	Fort Steele	25 " tunnel; 20 ft. open cut; shipping				
Society Girl	Moyie Lake	20	C. Farrel	Moyie City	35 " shaft; 30 ft. open cut; 80 ft. tunnel		60-70	30-50	
Minnie M. & Tiger	Tracy Creek	5	Fort Steele Dev. Co.	Fort Steele	128 " tunnel; 35 ft. cuts; shaft 20 ft.				
Lady Elgin	Grundy Creek	2	G. H. Bushby	Victoria	Prospect				
Tontine	Tanglefoot Ck.	3	C. M. Keep	Fort Steele	100 ft. tunnel and cross-cuts; 50 ft. shaft.	3		5	\$2
Young America	Wild Horse Creek	3	— Sherman	Spokane, W.	15 " 2 open cuts				
Rossland	Skookum Chuck	15	T. Mean	Fort Steele	Prospect				\$120
Try Again	Four-Mile Creek	9	A. W. Bleasdel	"	60 ft. tunnel	22			
Aldine	Horseshoe Canyon	1	J. Mean	"	35 " ; 8 ft. lead	10			
Brewer	Skookum Chuck	1	S. Brewer	Fairm't Sp'gs	20 " shaft; 15 "				
Lake Shore	Moyie Lake	12	Canadian Gold Fields	Moyie City	200 ft. with stoping, etc; 180 ft. tunnel in ore		60-70	40-50	
Moyie and Queen of the Hills	Moyie Lake	16	"	"	90, 100, and 90 ft. tunnels; considerable ore			40-50	
Ivanhoe	Tackle Creek	7	W. M. Violet	Fort Steele	60 ft. tunnel; open cut on ore				
Black Bear	Kimberly, Mark C'k	2	C. Estmere	Kimberly	60 ft. inclined shaft; 3 test shafts				\$68 in all values.

St. Eugene.....	Moyie Lake.....	20	Gooderham-Blackstock.....	Toronto.....	800 ft. tunnel; 209 ft. tunnel; 90 ft. shaft, tramway and concentrator.....	60-70	40-60
Building Stone.....	Bull River.....	120	E. Dilse.....	Fort Steele.....	300 ft. tunnels and drifts.....	.....	.....
Chickawon Stone.....	Bull River.....	20	John Fink.....	".....	".....	.....	.....
Martin M. C.....	St. Mary's.....	20	N. A. Wallinger.....	".....	".....	.....	.....
North Star.....	Mark Creek.....	70	N. Star Mining Co.....	".....	1,200 ft. tunnels, shafts and drifts.....	.....	.....
Estella.....	Tracy Creek.....	30	Johnson & Roberson.....	".....	".....	.....	.....
Dibble Group.....	Law Creek.....	10	C. M. Keep.....	".....	".....	.....	.....
Stemwinder.....	Mark Creek.....	5	N. M. McLeod.....	".....	".....	.....	.....
Ram's Horn.....	Tracy Creek.....	10	A. B. Grace.....	".....	".....	.....	.....
Big Chief.....	Boulder Creek.....	25	".....	".....	".....	.....	.....
Brittle Silver Gp.....	Sheep Creek.....	20	J. W. Arthur.....	".....	".....	.....	.....
Yontin.....	Bull River.....	20	C. M. Keep.....	".....	".....	.....	.....
Paris Exposition.....	Tracy Creek.....	15	Geo. Bushby.....	Victoria.....	Auriferous copper pyrites.....	.....	.....
Wasa.....	Wasa Creek.....	10	A. B. Grace.....	Fort Steele.....	".....	.....	.....
Hope.....	Mark Creek.....	40	J. Houghton.....	".....	".....	.....	.....
Gold Bug.....	Fort Steele.....	10	N. A. Wallinger.....	".....	".....	.....	.....
Col. Henderson.....	Six Mile.....	10	R. O. Jennings.....	".....	".....	.....	.....
Last Chance.....	Lost Creek.....	10	C. M. Keep.....	".....	".....	.....	.....
Phillips.....	Tobacco Plains.....	5	N. A. Wallinger.....	".....	".....	.....	.....
Bruce.....	Lost Creek.....	10	".....	".....	".....	.....	.....
Sullivan Group.....	Mark Creek.....	90	Sullivan M. Co.....	".....	Lead, 100 ft. wide; 300 ft. tunnels, drifts, &c.....	.....	.....
Bill Nye.....	Tracy Creek.....	90	Wm. Violet.....	".....	".....	.....	.....
*Kootenay Chief.....	Wild Horse Creek.....	.....	.....	.....	".....	.....	.....
Crow's Nest Pass Coal Co.....	Fernie.....	.....	Crow's Nest Pass Coal Co.....	Fernie.....	Samples coal, 2 ft. x 2 ft. x 2 ft.....	.....	.....
Ditto.....	".....	.....	".....	".....	Samples coke.....	.....	.....

East Kootenay District. Golden Mining Division.

Anaconda (Group)	Vermont Creek.....	60	Upton & Dainard.....	Golden.....	Copper and iron pyrites.....
"	".....	10	".....	".....	Copper sulphides.....
Minnie.....	".....	10	M. Carlin.....	".....	Galena and carbonates.....
Charlotte.....	".....	25	F. H. Bacon.....	".....	Galena.....
Ruth.....	".....	20	F. P. Armstrong.....	".....	Galena and iron sulphides.....
Good Luck.....	McLean Creek.....	40	Alexander McLean.....	".....	Chalcopyrite.....
Blue Bell.....	Vermont Ck. Sl. rd.....	15	Wm. Logan.....	Victoria.....	Copper.....
Hidden Treasure.....	Spillimachene Mtn.....	50	Henry Croft.....	".....	Copper.....
"	".....	20	".....	".....	Asurite and malachite.....
"	".....	15	".....	".....	Galena.....
Mountain Daisy.....	Jubilee Mountain.....	15	Stephen Redgrave.....	Golden.....	Copper glance.....
Lancaster.....	".....	25	John McRae.....	Winnipeg.....	".....
Atlanta.....	".....	15	Osler & Hammond.....	Toronto.....	Copper and galena.....
Rothschild.....	Spillimachene Mtn.....	20	Stephen Redgrave.....	Golden.....	Galena.....
Monday.....	M. F. Spillimachene.....	60	George Heffner.....	Galena.....	Copper.....
Ellen D.....	".....	20	Joliffe & Keyser.....	Golden.....	Grey copper.....

*Henderson Claim McMurdo Dist., N.
 F. Spillimachene.
 *McRae Claim Spillimachene.
 *Campbell Claim Jubilee Mountain.

East Kootenay District. Windermere Mining Division.

Bullion	Toby Creek	30	W. B. Abell.	Windermere.	Galena.	
Silver Thread	Law Creek.	40	Silver Thread Mining Co.	"	"	
Royal	Horse-thief Creek	5	C. A. Watt	"	Copper	
Anglo Saxon	No. 2 Creek	5	"	"	Galena.	
"	"		Wm. Colmet	"	Copper	
Black Diamond	Toby Ck., Jumbo Fk	20	Watt & Lake.	"	Galena.	
Caretaker	Boulder Creek	50	James McLeod	"	"	
Bryan	Copper Creek	5	F. Hammann	"	Copper and galena.	
Black Prince	Boulder Creek	5	C. Troyer	"	Copper	
Fisher	Dutch Creek	10	N. A. Allan.	"	Copper and galena	
Morning Glory	Copper Creek	10	Ellis & Jones.	"	Copper	
Golden Eagle	Law Creek.	30	T. A. Scott.	"	Galena.	
Delphine.	N. Fk. Toby Creek	70	Stark & Kimpfon.	"	"	
"	"	15	"	"	Copper	
Silver Pass.	Law and McDonald Creeks	25	Fraser & Power	"	Galena.	
Washburne	Toby Creek	10	S. Wilson.	"	"	
K. C.	"	25	Fraser & Power.	"	"	
Hot Pmch.	N. Fk. Toby Creek	40	Collett, Starbird, Stoddard & Abell.	"	"	
Swansea	Windermere Mtn.	30	Derby Mining Co.	"	"	
"	"	20	"	"	Grey copper and malachite.	
"	"	15	"	"	Grey copper, asurite, malachite and iron	
"	"	10	"	"	Iron and grey copper	
"	"	25	"	"	Malachite	
Dutchy	Dutch Creek	25	W. B. Abell.	"	Copper glance and malachite	
Nickel Plate	"	25	T. Lamb	"	Copper sulphides	
Thunder Hill	Upper Columbia L.	5	Thunder Hill Mining Co.	Victoria	"	
Delos	Boulder Creek	15	Jones & McNeish	Golden	Iron sulphides	
Dragon	Toby Creek	30	New Golden, B. C., Ltd.	"	Copper	
Pretty Girl	Boulder Creek	15	"	"	Chalcopyrite	
Leadwell	Toby Creek	15	Hurst & Legg	Windermere.	Tetrahedrite	
Lalee	"	5	"	"	Galena and copper	
Sitting Bull (Group)	Boulder Creek	5	B. Morrigan <i>et al</i>	"	Galena and copper	
Head Light	Horse-thief Creek	35	F. M. Chadbourne	Nelson	Galena	
Delphine.	Toby Creek		Kimpton & Co	Windermere.	"	

West Kootenay District. Ainsworth Mining Division.

Mine.	Locality.	Approx. Wt.	Owners or Agents.		Particulars—Tonnage or Values Shipped or Amount of Work Done.	Assays in		
			Name.	Address.		Cu. %	Pb. %	Ag. oz.	Au. $
Lucky Jim	Bear Lake	30	E. J. Mathews	Nelson	Zinc blende and silver values.			
"	"	60	"	"	Argent. galena			
Sunset	Whitewater	130	John Elliot	"	"			
Stranger	Jackson Basin	40	J. A. Whittier	Kaslo	"			
Jackson Mines	"	50	Jackson Mines, Ltd.	Whitewater.	"			
Antoine	McGuigan	200	"	"	"			
Little Phil	Ainsworth	150	J. F. Stevens	St. Paul, Min.	"			
Indiana	Whitewater	20	Indiana G. & S. Mining Co.	Whitewater.	"			
Star	Ainsworth	15	W. P. Hatch	Los Angeles, C.	"			
True Blue	Kaslo	30	H. B. Stevenson	Kaslo	Copper sulphides			
Maggie	Ainsworth	40	"	"	Argent. galena			
Josephine	"	40	Josephine Mining Co.	Ainsworth	"			
Tam O'Shanter	"	25	A. B. Irvine	Rossland	"			
Little Mamie	"	30	T. J. Lendrum	Ainsworth	"			
Highland	"	40	M. Stevenson	"	"			
Highlander	"	40	"	"	"			
United	"	100	"	"	"			
Tariff	"	100	A. W. McCune	Salt L. City.	"			
Blue Bell	"	100	Dan. W. Clark	Ainsworth	"			
C. P. M. & M. Co.	Woodbury Creek	125	Campbell Sweeney	Vancouver	" and zinc blende.			
Gertrude	Duncan River	75	C. P. M. & M. Co.	Minneapolis.	"			
Whitewater	Whitewater	40	Gold Hill, Ltd.	Toronto, Ont.	"			
Castic	Carpenter Creek	25	Whitewater Mines, Ltd	Kaslo	"			
B. N. A.	S. Fork Kaslo Creek	10	"	"	"			
Silver Bell	"	45	R. F. Green.	Kaslo	"			150
Whitewater Deep.	Whitewater	100	"	"	"			
Bluebell	Ainsworth	100	Whitewater Deep. Co	"	"			
Washington	Jackson Basin	300	Campbell Sweeney	Vancouver.	"			
W. Kootenay Brick & L. Co.	Proctor's Landing.	600	O. T. Stone	Kaslo	"			
Hunbolt	Crawford Creek	100	"	"	"			
Silver Bell	South Fork Camp	20	T. G. Proctor.	Nelson	Limestone			
"	"	3	McLaren <i>et al</i>	"	"			
Montezuma	"	3	R. F. Green.	Kaslo	Argent. galena.			150
Little Mamie	"	3	Bank B. N. A.	"	"			
Maggie	Hot Springs Camp.	6	"	"	"			
Jackson Mines	Jackson Basin	6	"	"	"			
		6	"	"	"			
		6	"	"	"			
		6	"	"	"			
Jackson Mines	Jackson Basin	50	Jackson Mines, Ltd.	Slocan.	"			
				Whitewater.	"			

Jackson Mines	Jackson Basin	30	Jackson Mines, Ltd.	Whitewater	Argent. galena	
Gertie	Duncan River	5	— Smith	Kaslo		
*Old Timer						
Otto's Midget	Hamill Creek		London Con. Gold Fields	Rossland	High silver values	
Silver Hill	Crawford Creek		J. Y. McKane	"	Argent. galena	
Lavina	Hamill Creek					

West Kootenay District. Nelson Mining Division.

Dundee Mine	Ymir	10	P. J. Gleazer	Ymir	Galena and pyrites, with gold values	
Chehalis	"	3	"	"	"	
Dumas	"	2	John Dean	"	"	
Hidden Treasure	"	2	"	"	"	
Silver Lake	"	3	P. J. Gleazer	"	"	
Fern	Nelson	3	Fern Gold Mining Co.	Nelson	"	
Sylvia	Toad Mountain	3	O'Driscoll	"	Auriferous pyrites	
Starlight	"	150		"		
Granite	Nelson	200	Duncan Mines, Ltd.	"	"	
Athabasca	"	400	E. N. Fell, Agent.	"	"	
Blackcock	Ymir	175	L. H. Long	Rossland	"	
Venus	Toad Mountain	15	Dr. Doolittle	Nelson		
Copper Crown	Forty-nine Creek	30	Waneta Trail Creek G. M. Co.	Rossland		
Tamarac	Ymir	5	Davys Lang	Ymir		
Willcock	"		K. E. McKenzie	"		
Dundee	"		Dundee Mining Co.	Rossland		
Exchequer	Nelson		Exchequer Gold Mining Co.	Nelson	Galena and pyrites, with gold values	\$ 140 00
Porto Rico	Ymir		Canada Pacific Express Co.	"	"	
Northern Light	Forty-nine Creek		H. R. Bellamy	"		
Agricola	Toad Mountain		W. H. Davidson	"		64 19 00
Clarence	Nelson		J. A. Gilken	"		200 10 00
Old Colony	Salmo		J. P. Sholtz	"		40 20 00
Silver Dollar	"		W. Watson	"		
Legal Tender	"		J. P. Sholtz	"		
Copper King	Forty-nine Creek		Copper King Mining Co.	"		
Victoria	"		Burr & Baker	"		
Dumas	Ymir		J. M. Masterson	"		5 36 00
Nevada	"		A.H. Gold Mining Co.	Rossland		
Bullion	"		G. W. Richardson	"		
Hidden Treasure	"		Wm. Hennessy	Ymir		2 30 00
Tennessee	"	Small	Hank Wade	"		8 00
Spodded Horse	"		Finlay McLeod	Nelson		15 00
Nell K	"		John Carroll	"		
Fairmount	"		W. J. Hughes	Ymir		
Lost Boy	"			"		
Jubilee	"		J. S. Masterson	Nelson		10 00
Ymir Bell	"					

West Kootenay District. Nelson Mining Division.—Concluded.

Mine.	Locality.	Approx. Wt.	Owners or Agents.		Particulars—Tonnage or Values shipped or Amount of Work Done.	Assays in		
			Name.	Address.		Cu. %	Pb. %	Ag. oz.	Au. $
Musketeer Group.	Ymir				Auriferous pyrites			
Ben Hur	"				"			
Fern	Hall Creek	70	Fern Gold Mining Co	Nelson	Bornite and chalcopyrite and silver.			\$50 00
Silver King	Toad Mountain	500	Hall Mines, Ltd	"				
Queen Group.	Wolf Creek	Small.	Waldie & Turner	"			7	58 00
Dandy	Toad Mountain	600	A. H. Kelly	Nelson	Galena and pyrites with gold values	2	35	2 50
Ymir Mine	Ymir	4 samp	Ymir Gold Mines, Ltd	Nelson	"			
Big Horn	"							
Dolly Varden	"							
Nevada	"		J. W. Masterson	Nelson				
Exchequer	Nelson		Exchequer Gold Mining Co.	A. H. Kelly, Nelson	Concentrates with gold values			
Silver Lake	Ymir		P. C. Gleazer	Ymir				
Hall Mines Smelter.	Nelson		Hall Mines, Ltd	Nelson	Set of samples illustrating smelter process.			

West Kootenay District. Slocan Mining Division.

Last Chance	Sandon	50	E. H. Tomlinson (Last Chance Mining Co.)	Sandon	Argent. galena			
Monitor	Three Forks	30	E. Harrop	Three Forks	"			
Fisher Maiden	Silverton	10	W. H. Russell	Spokane, U.S	"			
Mountain Chief	New Denver	750	G. W. Hughes <i>et al</i>	Three Forks	"			
Best	Sandon	300	"	"	"			
Payne	"	500	Payne Mining Co.	Sandon	"			
Noble Five	Cody	600	Noble Five M. & M. Co	Victoria	"			
Hustler Fraction	Three Forks	200	E. Harrop	Three Forks	"			
Queen Bess	Slocan	150	Duncan Mines, Ltd	Nelson	"			
Dardanelles	Sandon	3	Sir Hibbert Tupper	Vancouver	"			
Ruth	Cody	50	Geo. Alexander	Kaslo	"			
Goodenough	"	140	J. A. Whittier	"	"			
Trade Dollar	"	150			"			
Ocean	Sandon	10			"			
Vancouver Group	Silverton	10	Vancouver M. & M. Co.	Vancouver	"			
Noonday	"	10	H. J. Stewart	Silverton	"			
Red Mountain	"	20			"			

Wakefield	Silverton	D. Bremner	Silverton	Argent. galena		
Evening Star	Slocan City	H. Sutherland	Slocan City	"		
Emily Edith	Silverton	Hope, Gravelly & Co.	Vancouver	"		
Two Friends	Springer Creek	C. C. Bennett	"	"		
Rambler Cariboo	"	W. H. Adams	Kaslo	"		
Palmetto	Sandon			"		
Ajax	"	A. W. Wright	Sandon			
*Great Western						
*Slocan Boy						
*Stephenson Claim						
*Alamo						

West Kootenay District. Trail Creek Mining Division.

Iron Mask	Rossland	400	Iron Mask Gold Mining Co.	Spokane	6,000 ft. tunnels; shipped 10,000 tons ore.		1 1/2	\$30 00
Colonna	"	75	Monte Cristo Con. G. M. Co	Rossland	Included in Monte Cristo. No shipments.			
Virginia	"	80	Virginia Gold Mining Co.	"	2,800 ft. shafts and drifts.			
Monte Cristo	"	70	Monte Cristo Gold M. Co.	"	" "			
Evening Star	"	100	Evening Star Gold Mining Co	Spokane	" "		1	20 00
Gopher	"	200	Gopher Gold Mining Co	Rossland	" "			20 00
Evening	"	200	Eureka Gold Mining Co	"	200 foot mark		4	10 00
East St. Louis	"	70	East St. Louis Gold M. Co.	"	100 ft. shafts			20 00
Cliff	"	50	Cliff Gold Mining Co.	"	1,600 " tunnels; 800 tons shipped.		9	9 00
May Flower	"	30	Mayflower Gold Mining Co.	Spokane	200 " " and 115 ft. shafts.		30	4 00
Evening	"	40	Eureka Gold Mining Co	Rossland	200 foot mark		4	10 00
Giant	"	30	Giant Gold Mining Co	Spokane	200 ft. shafts and 200 ft. tunnel.			20 00
R. E. Lee	"	30	R. E. Lee Gold Mining Co.	Rossland	100 " " 150 "			38 00
Commander	"	20	Commander Gold Mining Co.	"	200 " " "			12 00
Good Friday	"	10	Good Friday Gold M. Co	Spokane	100 " " ; numerous open cuts		10	12 00
White Bear	"	5	White Bear Gold Mining Co.	Toronto	250 " " ; 300 ft. drifts			16 00
Mascot	"	10	Big Three Gold Mining Co.	"	3,000 " " ; tunnels, etc		216	8
Nest Egg	"	25	Nest Egg Gold Mining Co.	Victoria, B.C	200 " " "			10 00
Zilor	"	60	Zilor Gold Mining Co	Rossland	100 " " "		12	4 00
Victory-Triumph	Sophy Mountain	10	Victory-Triumph G. M. Co.	London, Eng.	" ; 300 ft. tunnels.			10 00
Sovereign	Lookout Mountain	15	John Ryan	Trail	100 " " "			10 00
Lily May	Rossland	100	English Canadian G. M. Co.	London, Eng.	250 " " and 500 ft. tunnels, etc.			4 00
Homestake	"	125	Homestake Mines, Ltd.	Rossland	300 " " 400 "		10	Assay s varia ble.
Deer Park	"	40	Deer Park Gold Mining Co.	Toronto	2,000 " " drifts; ship'd 18 tons			
Velvet	Sophy Mountain	45	Velvet Mines, Ltd.	London, Eng.	250 ft. shafts with 700 ft. drifts on 100, 160 and 250 ft. levels; cross cut tunnel now in 340 ft. will cut ledge at 320 ft., shipped 260 tons.		8	20 00
"	"	75						
Coxey and Gertrude	Rossland	50	Montreal Gold Fields, Ltd.	Montreal	300 ft. shafts and 800 ft. tunnels.		8	10 00
I. X. L.	"	2	I. X. L. Gold Mining Co.	Spokane	800 " tunnels, etc.; 500 tons shipped		2	40 00

West Kootenay District. Trail Creek Mining Division.—Concluded.

Mine.	Locality.	Approx. Wt.	Owners or Agents.		Particulars—Tonnage or Values shipped or Amount of Work Done.	Assays in				
			Name.	Address.		Cu. %.	Pb. %.	Ag. oz.	An. \$	
Le Roi	Rossland	595	Le Roi Mining Co.	London, Eng.	Large piece ore { Mine shipped 10,000 tons per month; average per ton \$15.50, net \$7.50... } Large piece ore Large piece ore	10		1	\$30 00	
"	"	595	"	"						
"	"	595	"	"						
Columbia Kootenay	"	591	Columbia Kootenay Mining Co., Ltd	"	Large piece	1			60 00	
Annie	"	590	West Le Roi Mining Co., Ltd	"		5		3	100 00	
Number One	"	592	"	"		3.6		3.5	30 00	
Le Roi	"	595	Le Roi Mining Co.	"		10		1	30 00	
Nickel Plate	"	450	Nickel Plate G. M. Co. of B.C.	Rossland						
War Eagle	"		War Eagle Con. Gold Mining and Development Co.							
Can. Pacific Smelting Co.	Trail, B. C.		Can. Pacific Smelting Co.	Trail	Set of samples illustrating smelter process.			5 to 10	30 00	

West Kootenay District. Lardeau Mining Division.

Prince Edward	Boyd Creek		C. E. Woods	Okanagan					
Brunswick	Fish Creek		T. A. Magee						
Mountain Boy	Mowhawk Creek		W. G. Girard		Argent, galena				
Lone Star	Lexington Creek		Thos. Dunn						
*Gladstone	"								
*Elizabeth	Fish Creek								

West Kootenay District. Revelstoke Mining Division.

Tangier	Downie Creek	10	Tangier Mine, Ltd.	Albert Can.	Auriferous pyrites				
Rosebery	Carnes Creek	15	Carnes Creek Con. G. M. Co.	Revelstoke	" and chalco pyrite				
"	"	10	"	"	"				
Mulligan	Keystone Mountain	3	McNeill & Leresque	"	"				
Ole Bull	Ground-hog Basin	5	B. C. Alliance Syndicate	London, Eng.	Gold quartz				
Annie	McCulloch Creek	2½	E. C. Erbsloh	"	"				
C. O. D.	Ground-hog Basin	8	B. C. Alliance Syndicate	"	"				
Orphan Boy	"	6	F. Davidson	Vancouver	"				

West Kootenay District. Goat River Mining Division.—Concluded.

Mine.	Locality.	Approx. Wt.	Owners or Agents.		Particulars—Tonnage or Values Shipped or Amount of Work Done.	Assays in			
			Name.	Address.		Cu. %.	Pb. %.	Ag. oz.	Au. \$
Lapland	Duck Creek		C. Farsland	Kuskonook		33		168	\$22 00
Accident	"								
Lizard	"								
Patrick	Goat Mountain								
Homestake	"								

West Kootenay District. Trout Lake Mining Division.

Black Diamond	14 miles f'm Trout L.	2 pkgs	Bailey & Co	Trout Lake	Argent. galena				
Silver Cup	8 " "	4 "	Sunshine, Ltd.	Revelstoke	" and gray copper		60	200	
Great Northern	5 " N.	2 "	Lillooet, Fraser R. & Cariboo	"	"				
Black Diamond	14 " "	2 "	Silver Tip Mg. Co. [G.F.Co.		"				
Silver Belt	14 " "	2 "			"				
Lade Group	S. F. Lardeau Ck.	2 "	Silver Belt Synd.	Trout Lake	Altered siderite, with free gold.				
John L.	15 miles f'm Trout L.	1 "	Lade Bros. et al	"					
Broadview	20 " "	1 "	L. G. Lynch et al						
St. Elmo	5 " "	3 "	Lillooet, Fraser R. & Cariboo	Revelstoke	Chalcopyrite and galena				
Catford	5 " "	2 "	H. McPherson. [G.F.Co., Ltd	.... [Station	Galena				
Pedro	14 " "	1 "	F. B. Wells et al	Revelstoke					
	20 " "	1 "							
Badshot	S. F. Canyon Ck.	3 "	A. Sandon	Trout Lake					
Little Robert	14 miles f'm Trout L.	1 "	F. C. Campbell et al	"	Argent. galena				
	14 " "	1 "							
Nettie L.	Duncan River	2 "	J. C. Kirkpatrick	"	"				
	5 miles f'm Trout L.	3 "	Gt. Western Co	Revelstoke	" and gray copper		60	200	
Mabel and Virginia	Pool Creek	4 "	E. M. Morgan et al	Trout Lake	"				
Silver Queen	8 miles f'm Trout L.	4 "							
	5 " "	2 "	Old Gold Quartz & P. M. Co.	Rossland	"				
Ethel	W. F. Duncan R.	2 "	J. M. Bird et al	Trout Lake					
American	3 miles f'm Trout L.	2 "	Thos. Taylor et al	"					
Mogul	12 " "	2 "	Jacobson & Olson						
Sunshine	5 " "	2 "	Sunshine Co., Ltd	Revelstoke	Argent. galena and gray copper				
Margie	8 " "	1 "		Trout Lake					
	5 " "	1 "	Jacobson and Olson						

Lillooet District. Lillooet Mining Division.

Bend d'Or	Bridge River	Bend d'Or Mines, Ltd	Gold bearing quartz	20 00
Cariboo	Camp McKinney ..	Cariboo Con. G. M. & M. Co.	Galena and pyrites in quartz	.....
Amelia .....	" ..	" ..	" ..	.....
Minnie-ha-ha	" ..	Minne-ha-ha Gold Mining Co.	" ..	.....
Waterloo	" ..	Waterloo Gold Mining Co ..	Gold quartz .....	.....
Fontenoy	" ..	Fontenoy Gold Mining Co ..	" ..	.....
Sailor	" ..	Sailor Gold Min. & Mill. Co.	Galena and pyrite in quartz	.....
*Wild West	Fairview .....	.....	Gold quartz .....	.....
*Brown Bear .....	" ..	.....	" ..	.....
Victoria	Camp McKinney ..	Rock Creek Gold Mines, Ltd	" ..	.....
Old England	Rock Creek	H. Nicholson, J. E. James ..	" ..	.....
Gold Standard	Camp McKinney ..	Lemon Gold Min. & Mill. Co	" ..	.....

Yale District. Osoyoos Mining Division.

Yale District. Grand Forks Mining Division.

Pathfinder	N. F. Kettle River.	Pathfinder Mining Co	Iron and copper sulphides .....	.....
Diamond Hitch ..	Brown's Camp	Hunter, Kendrick & Co .....	" ..	.....
Little Bertha .....	" ..	" ..	" ..	.....
Humming Bird	N. F. Kettle River.	Smith Curtis, Agent .....	" ..	.....
" " Frac. ....	" ..	" ..	" ..	.....
Bismark	Seattle Camp	Ross & Matheson .....	" ..	.....
Seattle .....	" ..	" ..	" ..	.....
Twins	Pass Creek	Porter Bros .....	" ..	.....
Rathmullen	Summit Camp	Rathmullen Gold Mining Co.	Pyrrhotite, with copper and gold	.....
B. C.	" ..	B. C. Chartered Co., Ltd	Chalcopyrite	20
Oro Denero	" ..	King G. M. Co. (Smith Curtis)	" and pyrrhotite .....	.....
Laurier .....	" ..	.....	.....	.....
Lillie K. ....	" ..	.....	.....	.....
Monte Christo	Hardy Mountain ..	.....	.....	.....
Little Babe .....	" ..	.....	.....	.....
Monte Carlo .....	" ..	.....	.....	.....
American Eagle	" ..	Hugh McGuire .....	.....	.....

Yale District. Grand Forks Mining Division.—Concluded.

Mine.	Locality.	Approx. Wt.	Owners or Agents.		Particulars—Tonnage or Values Shipped or Amount of Work Done.	Assays in		
			Name.	Address.		Cu. %.	Pb. %.	Ag. oz.	Au. $
Royal Victoria	.....	.....	Royal Victoria Mining Co.	Grand Forks.	.....	.....	.....	.....
Earthquake	Brown's Camp.	.....	R. Clark	"	Pyrrhotite and magnetite with gold values.	.....	.....	.....
Silver Knot	Summit Camp.	.....	Neil Hardy	"	" chalcocopyrite	.....	.....	.....
Humming Bird	Seattle Camp.	.....	Majestic Gold Mining Co.	"	Iron and copper sulphides	5	.....	10
Lexington	White's Camp.	.....	City of Paris Gold Min'g Co.	"	"	.....	.....	.....
City of Lincoln	"	.....	"	"	"	.....	.....	.....
City of Paris	"	.....	"	"	"	.....	.....	.....

Yale District. Kettle River Mining Division.

Mother Lode	.....	.....	B. C. Copper Co.	Greenwood.	Iron and copper sulphides with gold values	6	.....	10
Morrison	.....	.....	Morrison Mining Co.	"	"	5	.....	10
Buckhorn	.....	.....	Buckhorn Gold Mining Co.	Grand Forks.	"	.....	.....	.....
Gold Bug	.....	.....	Boundary Ck. Min. & M. Co.	Greenwood.	"	.....	.....	.....
Knob Hill	Greenwood Camp.	.....	Knob Hill Mining Co.	Phoenix	"	.....	.....	.....
Old Ironsides	"	.....	Old Ironsides Min. & M. Co.	"	"	5	.....	10
Brooklyn	"	.....	Dominion Copper Co.	Grand Forks.	"	.....	.....	.....
Stemwinder	"	.....	"	"	"	.....	.....	.....
War Eagle	"	.....	War Eagle Mining Co.	Phoenix, B.C.	"	.....	.....	.....
Winnipeg	Wellington Camp.	.....	Winnipeg Mining Co.	"	"	.....	.....	.....
Golden Crown	"	.....	Brandon & Golden Crown G.	Grand Forks.	"	.....	.....	.....
Jewel	Long Lake Camp	.....	Jewell Mining Co. [M. Co.	Greenwood.	Quartz with gold values in iron sulphides.	.....	.....	10
Enterprise	"	.....	Greenwood Gold Mining Co.	"	"	.....	.....	.....
Lakeside	"	.....	Cameron Emerson	"	"	.....	.....	.....
King Solomon	Copper Camp	.....	D. C. Corbin	Rossland	Copper carbonate and sulphides	.....	.....	.....
Big Copper	"	.....	A. H. McAuley	Greenwood	Iron oxides & sulphides with low gold values	.....	.....	.....
Old Iron Sides	Greenwood Camp.	.....	Old Ironsides Min. & Mil. Co	Phoenix	Iron and copper sulphides with gold values	.....	.....	.....
Knob Hill	"	.....	Knob Hill Gold Mining Co.	"	"	5	.....	10
Emma	Wellington Camp.	.....	McKenzie & Mann [Ltd.	Toronto	"	.....	.....	.....
Snowshoe	Greenwood Camp.	.....	B. C., Rossland & Sloean Sy.,	London, Eng.	"	.....	.....	.....

Yale District. Kamloops Mining Division.

Grass Roots	Jacko Lake	10	Dr. Wade	Kamloops	Magnetite and copper; 4 ft. lead		
Blue Bird	Sicamous		T. W. Wright	"	Copper pyrites		
O. K.	Coal Hill	15	Williamson <i>et al</i>	"	" ; 50 ft. lead		
Manson Creek	Manson Creek		G. McDonald	"	Galena and silver; irregular		
Lucky Strike	Coal Hill	15	B. C. Exploration Co.		Copper pyrites; 8 ft. lead		
Almaden	Hardie Mountain		Kamloops Cinnabar Co		Cinnabar		
Python	Coal Hill		Python Mining Co		Copper pyrites; 40 ft. lead		
North Thompson							
Coal Mines	N. Thompson River		S. O. Young		Coal		
Grass Roots	Jacko Lake		Dr. Wade		Copper pyrites and calcite		
Cyclone	"		Nestelle <i>et al</i>		"		
Gordon	Harper's Camp		Gordon Mining Co		Quartz and pyrites and gold		
Kimberly	Coal Hill		Kimberly Mining Co.		Copper pyrites; 18 ft. lead		
Joshua	Min'l Hill, Stump L.		Nicola Mining Co		Galena and copper pyrites		
Tubal Cain	"		"		" ; 18 ft. lead		
King William	"		"		" ; 2 "		
Enterprise	"		Mrs. Palmer		" ; 2 "		
Chieftain	Coal Hill		R. H. Lee		Copper pyrites		
Fragment	"		Dr. Wade		"		
Golden Star			Kamloops Copper Mining Co.		"		
Evening Star	Coal Hill		T. Morrison		"		
Copper King	Cherry Creek		Copper King Mining Co		"		
Pothook	Coal Hill				"		
"	"	20	Scottish Copper Mines Co. of	Victoria	Copper glance		
"	"		B. C., H. Croft, Agent		Native copper		
"	"				Bornite		
"	"				Magnetite and copper sulphides		
Truth	"		Truth Mining Co.	Kamloops	Copper pyrites		
Iron Mask	"		Iron Mask Mining Co.		" and iron pyrites; 3 ft. lead		
King	Grand Prairie		Angus & Mitchell		Molybdenite		
Almaden	Hardie Mountain		Kamloops Cinnabar Co.		Cinnabar		
Princess	Lewis Creek		Ward & Graham	Kamloops	Copper pyrites		
Wheal Tamar	Coal Hill		Coal Hill Copper Mining Co.	"	"		
Noonday	"		Noonday Mining Co	"	Quartz and gold		
Glen Iron Mines	Cherry Creek		Glen Iron Mines	"	Magnetite		

Yale District. Vernon Mining Division.

*Eagle Claim	Okanagan						
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Yale District. Yale Mining Division.

Mine.	Locality.	Approx. Wt.	Owners or Agents.		Particulars—Tonnage or Values Shipped or Amount of Work Done.	Assays in		
			Name.	Address.		Cu. %.	Pb. %.	Ag. oz.	Au. $
Summit City.....	Summit City.....	.....	Star Mining & Explorat'n Co.	Terre Haute, Ind., U.S.A.	.....	.....	.....	.....

Alberni District, West Coast of Vancouver Island Mining Division.

Castle Group	Bear River	5	Castle Mining Co	Clayoquot . . . . .	.....	.....	.....	.....	.....
American Wonder	Tranquil Creek	5	Gen. Ashton . . . . .	" . . . . .	.....	.....	.....	.....	4.3 \$2 50
Good Hope Group	Clayoquot	5	F. Jacobsen . . . . .	" . . . . .	.....	.....	.....	.....	1.2 2 00
Jumbo	"	5	Jumbo Mining Syndicate	"	Surface ore . . . . .	.....	.....	.....	.....
Jumbo	"	5	"	"	60 ft. below surface . . . . .	.....	.....	.....	9.7 2 00
Rose Marie	Kennedy Lake	4	B. Bonthrone	"	Pyrites and gold . . . . .	.....	.....	.....	.....
Rothschild	Deer Ok., Clayoquot	5	Hettie Green Mining Co.	Alberni	Magnetite and chalcopyrite . . . . .	.....	.....	.....	.....
Hettie Green Group: Little May Claim	"	5	"	"	Chalcopyrite . . . . .	.....	.....	.....	.....
Crow Group: Discovery Lead	"	6	Crow Mining Syndicate	Clayoquot	Pyrite and chalcopyrite . . . . .	.....	.....	.....	4.7 2 00
2 Sisters	"	15	"	"	Chalcopyrite . . . . .	.....	.....	.....	4 2 00
Indian Chief Group: Lower Outerop	Sydney Inlet	5	Jones & Kincaid	"	Chalcopyrite . . . . .	.....	.....	.....	4 1 00
Upper Outerop	"	5	"	"	Bornite . . . . .	.....	.....	.....	39 10 00

Alberni District. Alberni Mining Division.

Belvidere Group	Snug Basin	7	J. Stark	Nanaimo	Chalcopyrite . . . . .	.....	.....	.....	Trace. \$10 00
Seattle Group	Bear River	3	Seattle Mining Co	Victoria . . . . .	" . . . . .	.....	.....	.....	.....
Blue Bell Group	Snug Basin	5	A. Schaefer	Alberni . . . . .	" . . . . .	.....	.....	.....	26.6 10 00
Galena Group	Bear River	5	J Drinkwater	Clayoquot . . . . .	" . . . . .	.....	.....	.....	36 2 00
Thistle Group	Hawatches Creek	20	A. Watson	Alberni	Quartz and chalcopyrite . . . . .	.....	.....	.....	.....
Jingo Bird	Sproat Lake	1	D. Lindsay	"	Chalcopyrite and pyrrhotite . . . . .	.....	.....	.....	1.5 Traces
Lake Shore Group. Anderson Lake	Anderson Lake	5	Lake Shore Mining Co	"	Pyrrhotite and chalcopyrite . . . . .	.....	.....	.....	2 \$ 1 00
Mountain Treasure Group. Lord of the Isles	"	15	B. Bonthrone	Vancouver [Alberni] Sechart . . . . .	.....	.....	.....	.....	.....
.....	.....	5	— Anderson . . . . .	.....	Magnetite . . . . .	.....	.....	.....	.....

Great Expectations.	Toquat Harbour.	5	Beaumont Boggs.	Victoria	Chalcopyrites and quartz	.....	.....	.....	.....
Golden Eagle	China Creek	5	Newton	"	Pyrites and quartz	.....	.....	.....	3 \$56
3 W's	Granite Creek	10	English Can. Dev. Co	Alberni	Quartz, galena, pyrites	.....	.....	.....	6 \$40
Quarry	Nootka Sound	30	Nahmint Mining Co.	"	Building stone; marble (block)	.....	.....	.....	.....
Hayes Mine	Alberni Canal	20			Copper and iron pyrites	.....	28.5	.....	1 \$ 0 50

Victoria District. New Westminster Mining Division.

Providence	New Westminster Dis.	8	Providence Min. & Dev. Co.	Vancouver	Free gold in quartz	.....	.....	.....	.....
Quarry	Nelson Island	30			Building stone; granite	.....	.....	.....	.....
Keefe's Quarry	N. Arm, Burrard I.	30			"	.....	.....	.....	.....

Victoria District. Victoria Mining Division.

Phair Claim	Goldstream	5	J. Phair	Victoria	Chalcopyrite	.....	.....	.....	1 \$0 50
Quarry	Saturna Island	30			Building stone; sandstone	.....	15	.....	.....
"	Kokslah	30	C. Livingstone	Duncans	"	.....	.....	.....	.....
Tyce M. C.	Mt. Sicker		H. Croff	Victoria	.....	.....	.....	.....	.....
Lenora	"				.....	.....	.....	.....	.....

Nanaimo District. Nanaimo Mining Division.

Van Anda Smelter	Texada Island	40			Specimen of matte	.....	.....	.....	.....	.....
"	"	150	Van Anda Copper & Gold		Specimen of copper smelter product	.....	96	.....	.....	.....
Copper Queen	"	250	Co., Ltd	Texada Id.	Bornite and copper pyrites	.....	.....	.....	.....	.....
"	"	60			.....	.....	.....	.....	.....	.....
Cornell	"	80			Magnetite with copper	.....	15	.....	.....	.....
Raven	"	5	F. W. McCready	Texada Id.	Chalcopyrite	.....	8	.....	.....	.....
Red Deer Group	"	5	"	"	Bornite and chalcopyrite	.....	17	.....	.....	.....
Marble Bay	"	20			.....	.....	15	.....	.....	.....
Marble Bay, Fraction No. 1	"	10			"	.....	.....	.....	.....	.....
Marble Bay	"	10			Chalcopyrite	.....	14	.....	.....	.....
Prescot	"	20	Puget Sound Iron Co.	"	Magnetite; iron 65.2%	.....	28	.....	.....	.....
Newcastle Island	"	30			.....	.....	0.27	.....	.....	.....
Quarry	Gabriola Island	30			Building stone; sandstone	.....	.....	.....	.....	.....
Quarry	Haddington Island	30			Sandstone; building stone	.....	.....	.....	.....	.....
"	Texada Island	15			Building stone; andesite	.....	.....	.....	.....	.....
"					Marble slab; 6 in. square x 2 in. thick	.....	.....	.....	.....	.....

Nanaimo District. Nanaimo Mining Division.—Concluded.

Mine.	Locality.	Approx. Wt.	Owners or Agents.		Particulars—Tonnage of Values Shipped or Amount of Work Done.	Assays in				
			Name.	Address.		Cu. %.	Pb. %.	Ag. oz.	Au. \$	
Doratha Morton	Philipps Arm . . . . .	. . . . .	Fairfield Exploration Co.	Vancouver	Quartz with pyrite . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	15
Southfield	Nanaimo . . . . .	. . . . .	New Van. Coal & Land Co	Nanaimo	1 ft. cube coal . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
No. 1 Shaft . . . . .	" . . . . .	. . . . .	" . . . . .	" . . . . .	1½ " . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
" . . . . .	" . . . . .	. . . . .	" . . . . .	" . . . . .	2 " . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Wellington Col. Co	Union, V. I. . . . .	. . . . .	Wellington Colliery Co.	Victoria	Samples of coal 2' x 2' . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
" . . . . .	" . . . . .	. . . . .	" . . . . .	" . . . . .	" coke . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
" . . . . .	" . . . . .	. . . . .	" . . . . .	" . . . . .	" fireclay and brick . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .

BRITISH COLUMBIA SPECIMENS OF PLACER GOLD

—FOR—

PARIS EXPOSITION, 1900.

Consecutive Nos.	From whence obtained.		Owner of Claim.	How worked.	Nature of Specimen.	Weight of Specimen.	Value per oz.	Total value.
	Mining Divis'n—Locality.	Property.						
Lillooet:								
1	Cadwallader Creek	Lorne Mining Co	J. R. Williams & Co	Sluice	Amalgam	.....	\$ 15 50	
2	Fraser River	.....	Chinese	"	"	.....	15 50	
3	"	.....	"	"	Gold dust	.....	16 50	
4	Upper Bridge River	.....	D. Hamilton	"	"	.....	17 00	
5	Lower "	.....	C. Lush	"	"	.....	17 00	
6	Big Bar	.....	.....	"	Amalgam	.....	16 00	
Nelson:								
7	Hall Creek	.....	.....	.....	"	.....	35 00	
West Coast V.I.:								
8	Wreck Bay, Ucluellet	.....	J. E. Sutton	.....	Black sand	.....	.....
Cariboo:								
9	Quesnel River	.....	N. W. Dredging Co	Dredger	Amalgam	1 34-100 oz.	\$17 00	22 75
10	Fraser River	.....	.....	.....	Gold dust	1 25-100 "	16 00	20 00
11	Smoky River	.....	.....	.....	"	1 21-100 "	16 50	20 00
12	Cottonwood River	.....	.....	.....	"	31-100 "	17 00	5 25
13	Shepherd Creek	.....	Odlum & Shepherd	Hydraulic	"	1	17 00	17 00
14	Coffee Creek	.....	Moss & St. Clair	"	"	2	17 25	34 50
15	Slough Creek	.....	.....	.....	"	2	17 25	34 50
16	Lightning Creek	.....	.....	.....	"	1	17 25	17 25
17	Nelson Creek	.....	.....	.....	"	2	17 25	34 50
18	Burns Creek Mountain	.....	.....	Stamp mill	Gold	1 1/2	16 50	8 25
19	Lower Williams Creek	Cariboo Gold Fields Co	.....	Hydraulic elevator	Gold dust	2	16 00	32 00
20	Williams Creek	Black Jack Claim	.....	.....	"	1 1/2	15 87	23 80
21	Upper Williams Creek	San Juan Claim	.....	.....	"	2	15 50	31 00
22	Lowhee Creek	.....	Victoria Consolidated	Hydraulic	Amalgam	2	17 25	34 50
23	Cunningham Creek	.....	.....	.....	Gold dust	1 1/2	16 50	24 75
24	Grouse Creek	.....	.....	.....	"	51-100 "	16 00	8 10
25	Eight-Mile Lake	.....	.....	.....	"	1 1/2	17 00	25 50
26	.....	.....	.....	.....	Nugget	4 1-100 "	16 00	64 16

B. C. Specimens of Placer Gold for Paris Exposition, 1900.—Concluded.

Consecutive Nos.	From whence obtained.		Owner of Claim.	How worked.	Nature of Specimen.	Weight of Specimen.	Value per oz.	Total value.
	Mining Division—Locality.	Property.						
Cariboo—Concluded.								
27	Stout Gulch.....	.....	.....	Sluice.....	Nuggets.....	94-100 oz.....	\$17 25	\$ 16 22
28	Mosquito Creek.....	.....	.....	".....	".....	82-100 ".....	17 25	14 15
29	Williams Creek.....	Black Jack Claim.....	.....	".....	".....	48-100 ".....	15 75	7 56
30	Lowhee Creek.....	.....	.....	".....	".....	1 61-100 ".....	17 25	28 45
31	Lightning Creek.....	.....	.....	Sluice.....	".....	1 1-16 ".....	17 50	18 59
32	Summit Creek.....	.....	Colonial Min. & Dev. Co. Can.	Hydraulic.....	Gold dust.....	2 ".....	18 33	36 66
33	Stevens Creek.....	.....	Chinese.....	".....	Nugget.....	17 ".....	18 50	314 50
Quesnel:								
34	Quesnel Forks.....	Consolid Cariboo Hydr'c	Consol. Cariboo Hyd. Min. Co.	Hydraulic.....	Nugget.....	440 grains.....	.....	15 40
35	".....	".....	".....	".....	Nuggets.....	2 oz.....	16 30	32 60
36	".....	".....	".....	".....	Amalgam.....	2 ".....	9 00	18 00
37	".....	".....	".....	".....	".....	2 ".....	16 30	32 60
38	".....	".....	".....	".....	Platinum.....	2 ".....	12 00	24 00
39	".....	Horsefly Hydr'ic Mine.	Horsefly Hydraulic Mining Co.	Stamp mill.....	Gold.....	700 grains.....	.....	24 50
40	".....	".....	".....	Hydraulic.....	Black sand.....	1 lb.....	.....	.....
41	Horsefly River.....	.....	.....	".....	Gold dust.....	2 oz.....	16 90	33 80
42	Keithley Creek.....	.....	.....	".....	".....	2 ".....	17 40	34 80
43	Quesnel Forks.....	.....	.....	".....	".....	2 ".....	16 50	33 00
Golden:								
44	Quartz Creek.....	.....	.....	.....	".....	3 oz. 7 dwt. 16 grs...	18 00	67 66
Liard:								
45	Thibert Creek.....	.....	.....	Sluice.....	".....	1 oz.....	16 00	16 00
46	McDame Creek.....	.....	.....	".....	".....	1 1/2 oz.....	18 00	27 00
47	Dease Creek.....	.....	.....	".....	".....	1 ".....	15 00	15 00
48	Liard River.....	.....	.....	".....	Amalgam.....	9-16 oz.....	.....	9 00
49	Poorman Gulch.....	.....	.....	".....	Gold dust.....	1/2 oz.....	18 00	9 00
50	Messetoe Creek.....	.....	.....	".....	".....	1/2 ".....	18 00	9 00
51	Rosella Creek.....	.....	.....	".....	".....	1/2 ".....	18 00	9 00
52	Snow Creek.....	.....	.....	".....	".....	1/2 ".....	18 00	9 00
53	Quartz Creek.....	.....	.....	".....	".....	1/2 ".....	18 00	9 00
54	Walker Creek.....	.....	.....	".....	".....	1/2 ".....	19 00	9 50
Atlin:								
55	McKee Creek.....	.....	.....	".....	".....	2 ".....	16 25	32 50

56	Spruce Creek			Sluice	Gold dust	2 oz	16 25	32 50	
57	Pine Creek			"	"	2 "	16 25	32 50	
58	Birch Creek			"	"	2 "	16 25	32 50	
59	Willow Creek			"	"	2 "	16 25	32 50	
60	Wright Creek			"	"	2 "	16 25	32 50	
61	Pine Creek			"	Nuggets	31 " 1 dwt.	18 00	558 90	
62	Wright Creek			"	"	25 " 1/2 "	18 00	450 45	
63	Boulder Creek			"	"	19 " 3 "	18 00	344 70	
Ashcroft:									
64	Fraser River	Dredging Lease No. 1	W. H. Gallagher	Dredging	Gold dust	2 "	17 89	35 78	
65	Texas Creek Mouth	" No. 2	"	"	"	2 "	17 89	35 78	
66	Norman Bar	" No. 3	"	"	Black sand				
67	Lytton		Cobeldick Dredge No. 1 Co	"	Coarse gold, 1	0.8 oz.	19 00	15 20	
68	"		"	"	Medium "	2.2 "	19 00	41 80	
69	"		"	"	Fine "	3.1 "	19 00	19 00	
Kettle River:									
70	Rock Creek			Sluice	Gold dust	1 oz	16 50	16 50	
Fort Steele:									
71	Wild Horse Creek	Choo Chee Woo		"	"	1 oz	18 00	18 00	
Arrow Lake:									
72	Fire Valley Creek			"	"	9-10 oz.	16 00	14 40	
Yale:									
73	North Bend		Beatty Gold Dredg. & Min. Co	Dredger	"	2 8-100 oz.	17 27	36 27	
74	"		"	"	Platinum	1 7-10 "	10 00	17 00	
75	Granite City		" (Loaned by Baker & Co., Newark, N. J.)	"	Crude platinum				
Revelstoke:									
76	Big Bend	Ophir	Ophir Bed Rock Flume Co	Bed-rock flume	Gold dust	2 oz. 5 dwt. 14 grs.	18 00	40 90	
77	"	"	"	"	"	1 95-100 oz.	18 00	36 00	
78	Smith Creek	Carlisle Claim		Sluice	"	2 "	18 00	36 00	
79	Columbia River			"	"	2 "	18 00	36 00	
80	French Creek	Consolation	Geo. La Forme, &c	Drifting	Nugget	2 27-100 "	47 00	47 00	
81	"	"	"	"	Gold dust	1 oz. 3 dwt. 3 grs.	20 80	20 80	
Omineca:									
82	Manson Creek	Forty-Third Mining Co.		Hydraulic	Nuggets	2.35 oz.	16 50	38 77	
83	Vital Creek			Placer	Arquerite				

LIST OF PHOTOGRAPHS

CONTAINED IN EACH ALBUM SENT TO THE PARIS EXPOSITION.

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1. Government Buildings, Victoria, B. C.
2. Victoria Harbour, as seen from tower of Cathedral.
3. Bay on the East Coast, Vancouver Island.
4. Winter scenes in Kootenay.
5. On the trail to Atlin.
6. Salmon Cannery, Skeena River.
7. Cowichan Lake, Vancouver Island.
8. A logging scene.
9. Felling big tree near New Westminster, B. C.
10. A logging scene.
11. In Stanley Park, Vancouver, B. C.
12. " " "
13. Fishing fleet at the mouth of the Fraser River.
14. " " "
15. A salmon catch.
16. Large Salmon.
17. Salmon ships on the Fraser River.
18. Coke ovens at Comox, B. C.
19. C. P. R. Docks, Vancouver, B. C.
20. In Stanley Park, Vancouver, B. C.
21. On the Inlet, Vancouver.
22. Yale, B. C.
23. Fraser River.
24. Suspension Bridge near Spuzzum, B. C.
25. Looking up the Fraser, near Salmon River.
26. Salmon River Bridge.
27. Chuck Chuck Falls, near Spence's Bridge.
28. A Round-up on the Cattle Ranges near Kamloops.
29. Junction of North and South Thompson, near Kamloops.
30. Cherry Creek Falls.
31. A scene at the Glacier House, C. P. R.
32. "The Loop," in the Selkirks, C. P. R.
33. Hermit Range in winter, Selkirk Mountains.
34. Grizzly Peak at the Loop, C. P. R.
35. On the Great Glacier, Selkirk Mountains.
36. From Great Glacier, showing Glacier House.
37. Natural bridge on Kicking Horse River, near Field.
38. Mt. Stephen, showing silver mine.
39. Kicking Horse Flats, with Field in the distance.
40. C. P. R. Hotel and Mt. Stephen, Field.

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41. Emerald Lake, near Field, B. C.
 42. " " "
 43. Banff in winter.
 44. Lake Louise, near Laggan, B. C.—Canadian Pacific Railway.
 45. Three Sisters, Canmore.
 46. Blank.
 47. Hydraulic Mining in Cariboo.
 48. " " "
 49. " " "
 50. " " "
 51. Hall Mines Smelter, Nelson, B. C.
 52. Furnaces, Hall Mines Smelter, Nelson.
 53. Athabasca Mine, Kootenay.
 54. Silver King Mine, Nelson.
 55. Whitewater Concentrator, Whitewater, B. C.
 56. Concentrator, Ainsworth, B. C.
 57. Rossland, West Kootenay.
 58. Five hundred feet level of the Le Roi Mine, Rossland, B. C.
 59. Rossland.
 60. Bonnington Falls,
 61. " "
 62. Power House, Bonnington Falls.
 63. Near Rossland, B. C.
 64. Scenes in Kootenay (2 photos.)
 65. Copper Smelter, Trail.
 66. Old Ironsides and Knob Hill Mines, Phoenix, B. C.
 67. Grand Forks, B. C.
 68. Fruit Ranch, Boundary.
 69. Hoist of Cariboo Consolidated Gold Mining and Milling Co., Camp McKinney, B. C.
 70. Sandon, West Kootenay.
 71. Robson, B. C., Columbia River.
 72. Ruth Mine, Star Mt., Sandon.
 73. Lower Terminal, Last Chance Mine, Sandon.
 74. Greenwood, B. C.
 75. Alamo Mine and Tramway from Camp, Slocan, B. C.
 76. Cascade, B. C.
 77. Quartz Mill, Cariboo Consolidated, Camp McKinney.
 78. Lower Terminal, Last Chance Mine, showing tramway to mine.
 79. Queen Bess Mine from the Idaho, Slocan.
 80. Hoist, Lemon Gold Mining Co., Camp McKinney.
 81. Lower Terminal, Last Chance Mine, Sandon.
 82. Fontenoy Mine, Camp McKinney.
 83. Grand Forks, B. C.
 84. Looking north-east from Idaho Mines, Slocan, B. C.
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CARIBOO DISTRICT.

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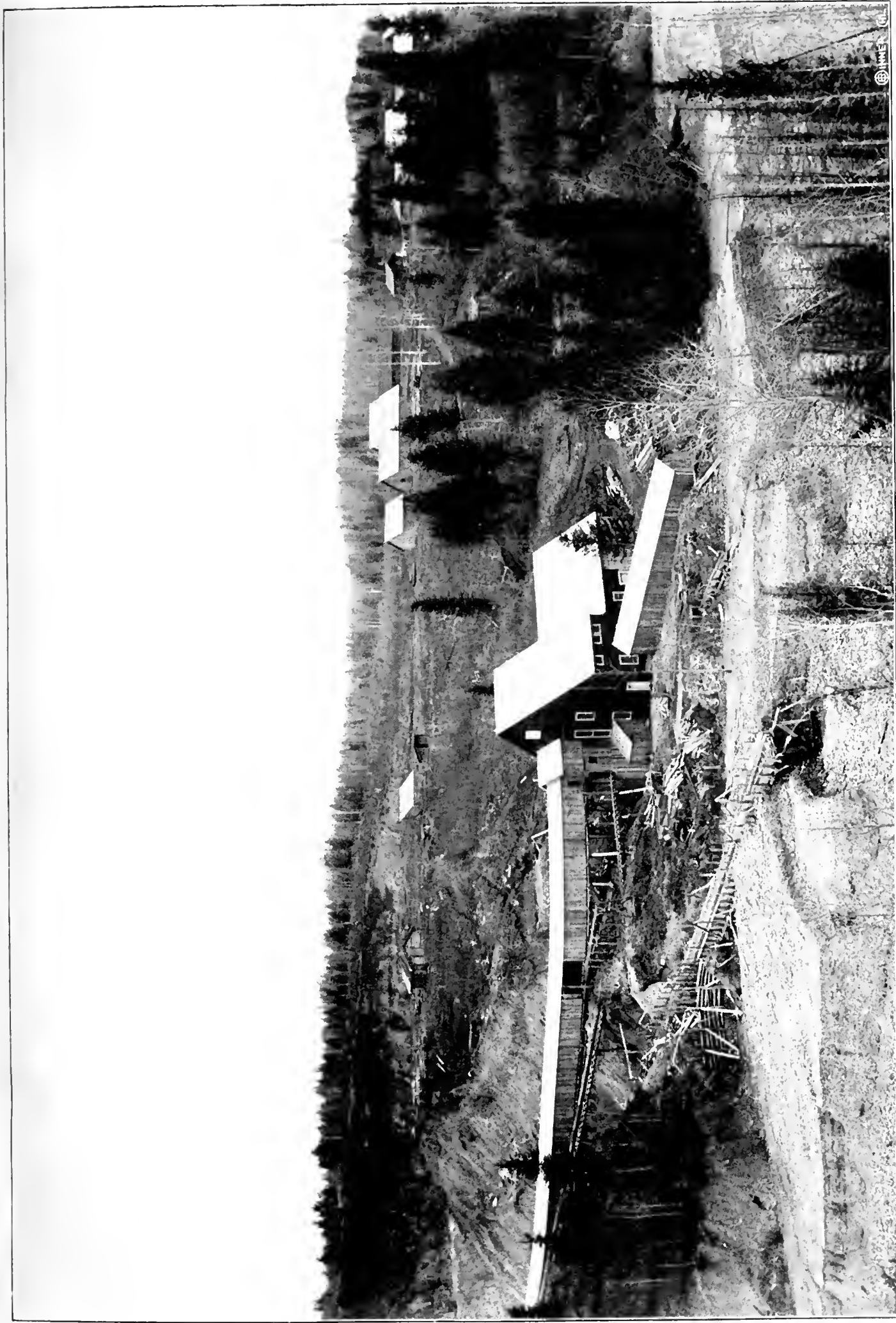
RICHFIELD AND QUESNEL MINING DIVISIONS.

REPORT BY JOHN BOWRON, GOLD COMMISSIONER.

I have the honour to submit herewith my twenty-fifth annual report of the mining industry of the Cariboo District.

* The Cariboo District extends from latitude 52° to latitude 60° , and from longitude 120° to longitude 124° , with a large south-eastern extension reaching beyond longitude 118° , and comprises nearly one hundred thousand square miles, more than one-half of which area is marked on the maps "unexplored." The portion of the District which has been prospected comprises but a very small part of its total area. Rich deposits of placer gold were first discovered in the southern portion, in the Quesnel Forks neighbourhood; the enormous yield of the Barkerville Division is a matter of history; further north in the Omineca Division very rich placers have been worked, yielding hundreds of thousands of dollars; in the Parsnip and Peace River sections adventurous prospectors have reported gold-bearing gravel as well as mineralized quartz ledges; and lately, to the east, in the neighbourhood of Tete Jaune Cache, similar discoveries have been made. It is therefore a safe assertion that whatever part of the District has been prospected has shown deposits of gold-bearing gravel as well as quartz ledges. In view of these facts, it seems certain that the vast and as yet unexplored portions of the District will some day open up an enticing field for an army of prospectors. Even in the southern and settled portions, the amount of virgin ground awaiting the prospector and capitalist seems almost limitless. The largest percentage of the gold which the Cariboo District has yielded has come from within a comparatively short radius around Barkerville and from the neighbourhood of the Forks of Quesnel and Keithley Creek. The reason for this apparently anomalous state of affairs is easy to explain. Lack of transportation facilities and remoteness from the base of supplies are the barriers which have kept the grand possibilities of the Cariboo District in the background. Barkerville, the most important and most northerly town of the District, is two hundred and eighty miles from Ashcroft, the nearest railway station. All supplies (except farm products), as well as machinery for the northern country, must come by waggon from Ashcroft. At best this is an expensive and slow method of transportation; and, when to this is added the fact that at certain seasons the road is well nigh impassable, the wonder is that individuals, or even companies, have had the temerity to launch out into the heavy expenditures necessary in order to open out large properties. The fact that there are at the present time more than thirty large enterprises prosecuting such development, at an enormous outlay of capital, is the strongest possible proof that, in the opinion of the experts representing millions of capital, the District is a gold mining field of more than ordinary importance. Was there a railway between Ashcroft and Barkerville, permitting the rapid and cheap transporta-

*NOTE.—The extent of the "Cariboo District" was materially altered January 1st, 1900, for which alteration see "New Mining Districts and Divisions."



HORSEFLY HYDRAULIC GOLD MINING CO.'S STAMP MILL FOR CEMENTED GRAVEL.

© JAMES G.



tion of machinery, not only would the country on each side of the railway be rapidly developed, but an immense and most promising area within a radius of one or two hundred miles of Barkerville would at once be thrown open to the waiting prospector.

In my opinion, there can be no question of the grand success attending the building of a railway from some point on the Canadian Pacific Railway northward through the central portion of the District, and further extending it as the development of the country advances, until, eventually, a connection be made with the headwaters of the Yukon River. Not alone on the mining industry would such a railway have to depend, for it would pass through some of the richest farming lands and hundreds of square miles of the finest cattle-raising country.

May I be permitted, as an old resident of the District, to remark upon the apparent apathy of successive Legislatures to what I regard as the best interests of, not alone the District, but of the entire Province, namely: the providing of urgently needed, better means of communication with this northern country. The effect of such would be shown here as readily and surely as has been evidenced in the Kootenays. Two years ago the first step towards such better facilities, by the introduction of traction engines upon the Cariboo Waggon Road, was defeated in the Legislature.

The unanimous cry of those who are spending large sums of money to open up and develop the undoubtedly immense gold deposits of the District is for better, quicker, and cheaper transportation facilities. It is said that there are now at Ashcroft, awaiting a passable condition of the roads, over eight hundred thousand pounds of machinery and other supplies for different points in the upper country. It is difficult to approximate when the last of this will reach its destination, to say nothing of that which will arrive at Ashcroft in the meantime.

In further reference to transportation facilities between Ashcroft, on the C. P. Ry., and Cariboo, I may say that the distance between Ashcroft and Barkerville is 280 miles. The waggon road between these points (known as the Main Trunk Road) is, during dry weather, regarded as a first-class highway, over which the B. C. Express Company's four-horse coaches make semi-weekly trips in summer and weekly trips in the winter, carrying Her Majesty's mails and passengers, and making the distance in four days. Passenger fare is \$42.50.

Freighters use four, six and eight-horse teams during the whole year, using sleighs in the winter season, but the narrow waggon tires in use during the summer so cut up the roads in wet seasons, such as that of 1899, as to make it almost impassable, although the Government annually spends large sums of money to keep it in repair. Freight teams require from twenty-five to fifty days to make the trip from Ashcroft to Barkerville, according to the condition of the road. There is usually in winter good sleighing for about two months on the lower part of the road, and about four months on the northern part, during which time large quantities of freight are brought in. The usual freight rates are from five to six cents per pound to Barkerville, and proportionately less for shorter distances.

The hotel accommodations are fairly good the whole distance.

There is much good agricultural and pastoral land in the southern part of the District; consequently, beef and farm produce can be obtained at fair prices. Fine crops of all kinds of cereals are grown, several farmers raising upwards of 300,000 pounds of grain annually, the production being limited only by the demand at the mines, being capable of expansion as a further development of the mines furnishes a market. The pastoral lands of the district will always be capable of furnishing a surplus of good beef and mutton.

The ruling prices at Barkerville, by retail, of some of the principal commodities are as follows:—

Beef	10 cents to 15 cents per pound.
Flour, per cwt	\$8 to \$10.
Ham and bacon	30 cents to 33 cents per pound.
Rice	12½ cents per pound.
Sugar	12 cents to 15 cents per pound.
Canned peas, corn, tomatoes.....	37½ " 40 " per can.
Dried fruit	25 cents per pound.
Raisins and currants	20 " "
Tea	60 " to \$1 "
Beans	10 " "
Oats	5 " to 6 cents per pound.
Hay, per ton.....	\$50.
Wages, per day	\$3 to \$4.
Board, per week.....	\$8.

In my Report last year I made the remark that the District was on the eve of a prosperity not equalled for many years. The evidence of this fact is becoming more pronounced every day. Nothing, except the total failure of our, at least primitive, methods of communication, can prevent the steady advance of the District until it shall have regained the position it once held as a gold producer. The time has come when the needs of this upper country imperatively demand better facilities.

The excitement caused by the gold discoveries on the Yukon and at Atlin has drawn away a number of the men who in previous years have been engaged in actual mining in this District, while the extensive development and construction work being carried on by the large companies, has, during the past year, caused a demand for labour that far exceeded the supply, leaving few men available for the ordinary placer work, which, together with an exceedingly wet and short season, accounts for the fact that the gold product of the District this year falls somewhat below that of 1898.

The following are some of the more prominent enterprises now engaged in development work in the District. They are all enterprises of magnitude, involving the expenditure of considerable time and large sums of money before they can reach the state of gold producers. These and a number of others recently organized, which will begin active work during the coming summer, are looked to with assurance to demonstrate the merits of the District and to bring about their general recognition and appreciation.

In the Quesnel Forks Division there are—

- The Cariboo Consolidated Hydraulic Mining Company, Limited.
- The Victoria Consolidated Mining Company, Limited.
- The Golden River Quesnel, Limited.
- The Montreal and British Columbia Prospecting and Promoting Company, Limited.
- The Maud Hydraulic Mining Company, Limited.
- The New England Dredging Company, Limited.
- The Gold Point Hydraulic Mining Company.
- The Cariboo Mining Syndicate.
- The California Consolidated Mining Company.
- The Newell Dredging Company.
- The Horsefly Hydraulic Mining Company, Limited.
- The Horsefly Gold Mining Company, Limited.
- The Miocene Gold Mining Company, Limited.

In the Richfield Division there are—

- The Cariboo Gold Fields, Limited.
- The Cariboo Consolidated, Limited.
- The Cariboo Gold Lands.
- The Colonial Mines Development Company of Canada, Limited.
- The Cariboo Deeps, Limited.
- The Waverly Hydraulic Mining Company, Limited.
- The Willow River Enterprise.
- The Cariboo Mines and Development Company.
- The Lightning Creek Gold Gravels and Drainage Company, Limited.
- The Peters Creek Gold Mining Company.
- The Sutherland Hydraulic Gold Mining Company, Limited.
- The Incorporated Exploration Company.
- The Cariboo Exploration Company.
- The Devil's Lake Mining Company.
- The Slocan-Cariboo Gold Mining Company.

In the Quesnel Division there are—

- The Columbia Gold Mining Company, Limited.
- The Pittsburg and Cariboo Dredging Company, Limited.
- The Northwest Dredging Company, Limited.
- The Hall Dredging Company.
- The Cottonwood Alluvial Gold Mining Company, Limited.
- The C. J. Seymour Baker Company.
- The Golden Province Mines Company, Limited.

THE CARIBOO CONSOLIDATED HYDRAULIC MINING COMPANY, LIMITED.

J. B. Hobson, Manager.

This is undoubtedly the largest hydraulic plant in the Province, and will take rank with the largest in the world. I greatly regret that time will not admit of my communicating with Mr. Hobson, at Quesnel Forks, with a view to obtaining from him full data of the huge plant comprised by their undertaking. However, a few facts that have come under my personal observation during a visit to the property a year ago, together with information gleaned from conversations held with men who have been engaged on the works, will give some idea of the magnitude of the undertaking.

The original discovery of gold-bearing gravel on the location now being worked was made some seven years ago by a company of Chinese working on Dancing Bill Gulch, a tributary of the South Fork of Quesnel River. Their prospecting disclosed a huge blind river channel running parallel to the main river. After thorough investigation, the property was purchased by the Cariboo Consolidated Hydraulic Mining Company, Limited, since which time most elaborate preparatory work has been prosecuted uninterruptedly. During the past five years, from one to two hundred men have been engaged. During the process of opening up the property to its present state, something like half a million dollars in gold dust has been produced. As the mine can hardly be said to be fairly opened up as yet, and as practically all the enormous preliminary expenditure for ditches, flumes, dams, piping, etc., has been met, satisfactory dividends seem eventually assured.

The principal ditches are the Polley's Lake ditch, seventeen miles in length, having a capacity of 3,000 miner's inches of water; the Moorehead Creek ditch, just completed, ten

and a half miles in length, with a capacity of 2,000 miner's inches. In addition to these, several of smaller capacity have been constructed. Three monitors were worked continuously during the season, one of them having a discharge, or nozzle, nine inches in diameter, the other two having nozzles of seven inches diameter. Piping was carried on in two pits, pipe connections being so arranged that while the boulders were being removed from one pit the monitors were trained against the bank in the other. The pressure under which the water strikes the bank is due to 380 feet head. The bank, or face, against which this enormous force is directed is 400 feet in height. The iron piping leading from the penstock to the monitors varies from eighteen to twenty-four inches in diameter.

In order to expedite the disintegration of such a huge bank, a series of shafts are sunk and the face blasted off. Last season, in a single blast, one hundred thousand pounds of powder were discharged. During the past season, the Company has, as usual, prosecuted work with the utmost vigour. A large force of men has been employed, and piping was carried on during the whole season. I have not at hand particulars of the extent of ground moved, but it was a very large amount. The management, however, has had to face a huge block of unproductive ground, which had to be moved before the rich pay gravel was uncovered.

NOTE BY PROVINCIAL MINERALOGIST.—The following data are taken from the Annual Report of the Company, dated February 17th, 1900, and supplying some information not available when Mr. Bowron's report was written:—

“The Company's property is located in the Quesnel River mining region, famous for its rich shallow placers, its extensive system of ancient river channels, and its immense deposits of high grade auriferous gravels.

“It is situated at Bullion, Cariboo District, British Columbia, on the southerly side of the South Fork of the Quesnel River, about four miles easterly from the Town of Quesnel Forks, four miles westerly from the outlet of the great Quesnel Lake, about one hundred and ninety miles, *via* the One Hundred and Fifty-Mile House and Beaver Lake, and about one hundred and seventy miles, *via* the One Hundred and Eight-Mile House and Horsefly by waggon road from Ashcroft, on the line of the Canadian Pacific Railway.

“The property comprises thirty-four placer mining leases, aggregating two thousand five hundred and eighty-four acres of land, and a block of pasture land containing three hundred and twenty acres. The mining leases cover, for a distance of about ten miles, the auriferous deposits of a system of ancient rivers

“The deposits included in the Company's property vary from four hundred to six hundred feet in depth from surface to bottom of channel. The quantity is estimated at five hundred millions of cubic yards of high grade auriferous gravel that is available for future washing by hydraulic process. The average gold tenure is moderately estimated at twenty cents per cubic yard, and the total gold content at one hundred millions of dollars.

“The Consolidated Cariboo Hydraulic Mining Company's water supply system, as now completed, consists of thirty-three miles of well constructed canals, having a capacity for delivering at the mine five thousand miners' inches of water under a head of four hundred and twenty feet.

“The camp equipment of the water supply system consists of twelve substantial cabins for the reservoir tenders, and water tenders operating along the line of the main canals.

“The mine equipment consists of a portable hydraulic plant of four lines of thirty inch and twenty-two inch riveted steel pipes, aggregating six thousand feet; six No. 8 Hydraulic Giants, with deflecting nozzles, varying from six to ten inches in diameter, &c., &c.

“The gold saving appliances consist of a double extended system of sluices seven feet wide by four feet deep, aggregating two thousand three hundred and eighty feet in length. This

system of sluices is paved partially with end-wood sluice blocks one foot thick, and partially with improved longitudinal steel riffles. Fixtures and longitudinal steel riffles are on hand for the installation of two improved undercurrents intended for the recovery of flour quicksilver, fine gold, platinum and osmiridium that cannot be recovered in the ordinary sluice.

"The melting plant consists of three retorts fitted with iron Liebig condensers for distillation of quicksilver, having a capacity for treating twelve thousand ounces of amalgamated gold at a single charge; two furnaces for melting, and other appliances necessary for handling ingots of gold weighing up to twelve thousand ounces; also a complete assay outfit for determining the value of bullion.

"The season's (1899) operations were confined mainly to the removal of the remainder of the accumulations of tailings, boulders, and sliderock left in the old Chinese workings; the removal of the boulderclay, low grade gravel and sliderock that laid on the rims of the channel south and west of the old Chinese workings; to the permanent installation of the hydraulic plant, gold-saving appliances, and other plant required to complete the equipment of the property; and to repair the extensive breaks that occurred on the line of the Morehead Canal.

"The expenditure for the season's operations is distributed as shown by the following statement:—

"Clearing the Hydraulic Pits of 1,952,535 cubic yards of boulderclay, low-grade gravel, tailings, boulders and sliderock, to make room for the permanent installation of the Hydraulic Plant gold-saving appliances.....	\$127,879 40
"Construction of crib and stone dam for Morehead Pooling Reservoir.....	6,422 23
"Completion of Retorting Furnace and Melting plant.....	3,617 30
"Installation of Hydraulic Plant and gold-saving appliances in South Fork Pit.....	8,679 84
"Installation of Permanent Sluices in Pit No. 1.....	7,096 10
"Installation of Permanent, and additions to Portable Hydraulic Plant, Pipes, Giants, etc.....	\$9,998 56
"Construction of Pipe Ladder on bluff at Dancing Bill Gulch.....	1,165 96
"Constructing Waste Water Flume down bluff at Dancing Bill Gulch.....	462 75
	11,627 27
"Reservoir Gate at Polleys Lake.....	355 50
"Additions to Mining Plant, Hoisting Engine, and Well Lights..	1,526 70
"Installation of Steel Riffles for Sluices and fixtures for two Undercurrents.....	5,676 88
"Construction of necessary Camp Buildings.....	3,293 29
"Construction of Flumes around Slides on Morehead Canal.....	18,346 00
	Total Expenditure for the Season.....\$194,520 51

"SUMMARY OF THE SEASON'S HYDRAULIC WORK.

"Total time run.....	144 days 8 hours.
"Total quantity of water used.....	353,056 miner's inches.
"Total quantity of gravel, sand, clay, tailings, boulders, and sliderock removed from both Pits during the season.....	1,952,535 cubic yards.
"Value of gold recovered during the progress of the season's work.....	\$92,678 93

The Victoria Consolidated Hydraulic Mining Company and the Montreal and British Columbia Mining Company have had a "leave of absence" from working during 1899.

THE GOLDEN RIVER QUESNEL COMPANY.

The unusual and phenomenal rains during the past season, while serving to benefit those engaged in hydraulic mining, had the effect of preventing the closing of the huge dam of the Golden River Quesnel Company until the season was well nigh spent. This dam is situated at the outlet of the South Fork of Quesnel Lake, and below this the Cariboo Consolidated Hydraulic Mining Company dump their tailings into the South Fork River. It was found, upon closing the dam, that these tailings had so clogged the river that the water was dammed and held back, thus preventing the Golden River Company from making anything like a fair test of their ground. In an average season no such detrimental conditions will prevail, it is believed.

The Maud Hydraulic Co., the Cariboo Mining Syndicate, the California Consolidated Co., and the Cariboo Consolidated Co. have, during the season, made but little progress toward the development of their concessions near Quesnel Forks.

THE HORSEFLY HYDRAULIC MINING COMPANY, LIMITED.

J. B. Hobson, Manager.

During the process of opening up this mine an extensive bed of cemented gravel was encountered, which proved too hard to be treated by the ordinary hydraulic method. Prospecting and sampling having yielded conclusive evidence that it contained gold in paying quantities, a ten-stamp mill was erected last season. It is proposed to pass the cemented gravel through this mill and then remove the free gold by the ordinary sluice-washing. The Company has also been continuously engaged in running tunnels to determine the extent of this auriferous cemented gravel. I am informed that the result of this exploratory work has been most satisfactory.

THE HORSEFLY GOLD MINING COMPANY, LIMITED.

R. T. Ward, Manager.

After several years of preparatory work, this Company now has its extensive property opened up and in the condition of a finished and producing mine. The works consist of extensive ditches, flumes, dams, &c., and are being operated under the hydraulic elevator system. During the past summer some phenomenally rich ground was uncovered. The affairs of the Company are in a most satisfactory condition, and those interested are to be congratulated in having, as a result of their persistent efforts, what gives every promise of being a very profitable property. Lack of time has prevented my visiting and obtaining more definite data regarding this promising enterprise.

THE MIOCENE GOLD MINING COMPANY, LIMITED.

R. H. Campbell, Manager.

This Company set about establishing in a very thorough and business-like manner its belief that the old channel of the Horsefly River had been located, and that it would be found rich in gold. Last season, as intimated in last year's Report, a small shaft was sunk, to ascertain the depth to bed-rock. What was supposed to be the bed-rock, in the gutter or bottom of the channel, was reached at a depth, unusual in this country, of 410 feet. At the same time a very flattering foretaste of the yellow metal was had. So well was the management impressed with the prospects secured, that no time was lost in starting a large working

shaft and installing a permanent and powerful outfit of machinery. A battery of large boilers; heavy steam pumps, designed to lift the water, in series, from a great depth; a well-appointed saw-mill; a plant for supplying electric light for the workings and all buildings; and a powerful hoist, together with complete sets of blacksmith and engineers' tools, constitute as complete an outfit as has ever been placed on a deep ground property in the Province. Work was carried on unceasingly with three shifts, until, this fall, the unlooked-for depth of 490 feet was reached. At this level bed-rock was encountered, but, contrary to expectations, it was found to be dipping off to still deeper ground. As this depth was much more than had been provided for, it was deemed advisable to put in further pumping facilities. I have been informed that the Company is considering the advisability of putting in an air compressor and running the pumps with compressed air in place of steam. As soon as conditions permit, the new additions to the plant will be on the ground and active work resumed. While the actual value of the prospects found has not been officially published by the Company, entire satisfaction is expressed with the results so far obtained, and it is a reasonable certainty that this extensive property will ere long be a large producer of gold.

THE BARKERVILLE AND LIGHTNING CREEK DIVISIONS.

THE CARIBOO GOLD FIELDS, LIMITED.

Last season was the first in which this Company was able to put in operation its immense plant. Its property consists of practically all of Williams Creek, from Barkerville to the Meadows, from which such an enormous yield of gold was had in the 60's. The proposition is to handle all the ground remaining, from bed-rock to the surface, by means of the hydraulic elevator system. Two such elevators, of large proportions, have been installed side by side. During the past two seasons the Company has been engaged in opening a pit to bed-rock. Although last season proved short for the purpose, and only 46,000 cubic yards were elevated, a pit is now finished of sufficient dimensions to warrant a much larger output henceforward. A sufficient amount of work has now been done to prove to the satisfaction of the Company the value of the property. The elevator system, however, although no experiment, does not seem to be exactly adapted to all the conditions met with in the undertaking. The greatest difficulty encountered is that the elevators do not seem capable of raising sufficient material to the height required (nearly 100 feet), in one lift, to yield a return adequate to the enormous expense of the plant. It is especially difficult to find any material sufficiently hard to resist the tremendous abrasive effect caused by the passage through the elevators of rocks and gritty material at the high velocity necessary to raise the material 100 feet vertically in a water column.

The local Manager advises me that the company is considering the advisability of installing mechanical bucket elevators of large capacity. For a further description of this plant, see my report of 1897.

THE CARIBOO CONSOLIDATED, LIMITED, WILLIAMS CREEK.

William Thompson, M. E., F. R. G. S., Managing Director.

This Company, organized by English capitalists early in 1899, acquired a number of placer mining leases on Lightning, Williams, Lowhee, Antler and French Creeks, together with several properties in the Quesnel Forks Mining Division. Under the management of Mr. William Thompson, immediately upon the opening of Spring, active exploratory work was

begun on a number of the Company's various acquisitions. On at least three of the properties, immediate success was had, several hundred ounces of gold being secured. Necessarily, the major part of the work was preparatory and of the nature of development, so that the fact of finding such a quantity of the yellow metal, the first season of the existence of the Company, is a very flattering result. The Company is fortunate in possessing ample financial resources and able management, so that it will doubtless be heard from later. Briefly outlined, the work so far done is as follows:—

A ditch, which, before the Company acquired the property, brought a small amount of water for five miles to the workings, was enlarged and put in a thorough state of repair. An extensive and thoroughly modern hydraulic outfit, which is now on the way from San Francisco, will be installed on the property upon its arrival and it is earnestly hoped the plant will arrive in time for the Spring opening. An additional water supply to the amount of 1,000 miner's inches has been granted, and will be brought on to the ground as soon as the necessary ditches can be dug. The claim was worked during the past season in a small way, with success.

A preliminary survey has been made to locate a line of ditch to bring, from Cariboo Creek, a supply of water for hydraulic working. Extensive prospecting was done on the property last fall, consisting of some two hundred feet of tunnel and cross-cuts.

This property has now a water supply of 550 miner's inches, and 300 inches more were granted last fall. This additional amount will be available as soon as the necessary ditches are completed. The claim was worked in a small way last season by piping.

This promises to be an extensive property, and will be worked in a large way. The Company is now vigorously pushing a large tunnel, five hundred feet in length, through the rim-rock to tap the channel in the hill, which apparently runs parallel to Lightning Creek, where the hydraulic plant will be installed. A hydraulic outfit of large capacity is now on the way from San Francisco, and it is hoped it will be erected on the property in good time for the opening of Spring.

Last Fall a large force of men was engaged in repairing and enlarging the old ditch taking water from Last Chance Creek. This remodelled ditch will have a capacity of 450 miner's inches. A grant was secured last Fall of 4,450 miner's inches in addition to the above. This supply will be brought from Lightning Creek and the tributaries of Little Swift River. It is proposed next summer to construct the necessary ditches, which it is estimated will cost upwards of \$100,000. The property was worked in a small way last season by ground-slucing, with satisfactory results.

THE CARIBOO GOLD LANDS.

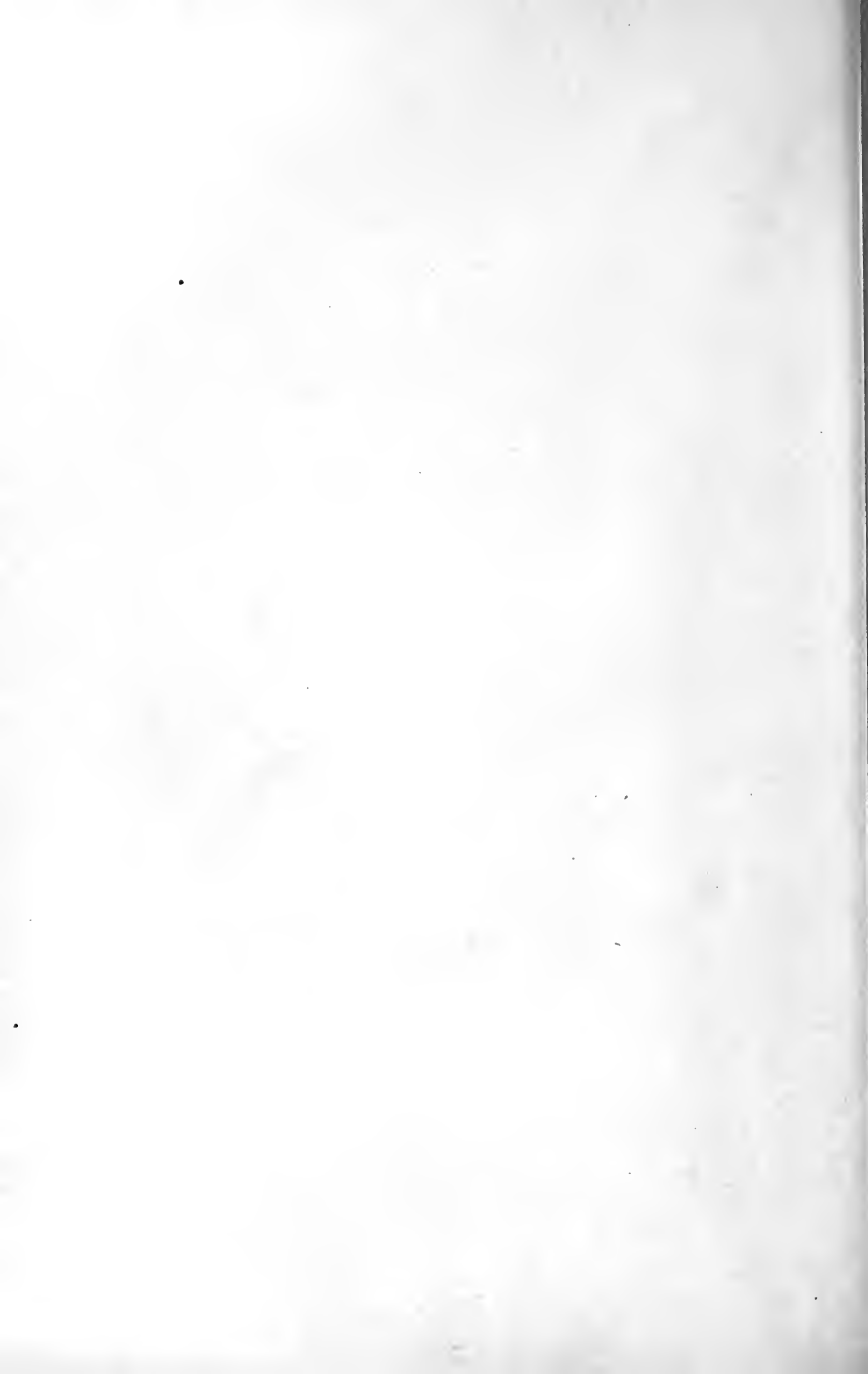
Messrs. Maund and Bremner, of London, England, mining experts, visited the District in 1897, and, as a result of their investigations, secured a number of valuable properties, among them being promising claims on Conklin's Gulch, a tributary of Williams Creek. Last season's operations consisted principally of making thorough surveys of the different holdings, re-locating the ground, applying for leases (the ground being previously held by record), and running lines for the extensive ditches that will be required to work the different properties on an adequate scale. Without doubt, the coming summer will see a large force on construction work.



NEWALL DREDGE—CUTTING THROUGH BAR—FRASER RIVER.



NEWALL DREDGE—IN OPEN WATER.



THE COLONIAL MINES DEVELOPMENT COMPANY OF CANADA, LIMITED.

Hamshaw and Youngs, Managers.

This Company, under the local management of Messrs. Hamshaw and Youngs, owns extensive properties on Summit Creek. The workings consist of a shaft, to prospect the original channel of the creek, and two hydraulic claims, known respectively as the *Victoria* and *Van Winkle*.

The shaft, to prospect the deep ground, was sunk to a depth of 100 feet. From this level a tunnel was run, which, it was hoped, would intercept the channel. At a distance of 175 feet, however, the rim-rock on the other side of the channel was encountered, thus showing that they were not deep enough to strike the bottom of the gutter. A blind shaft is now being sunk in the tunnel to determine the exact depth of the original channel. As soon as this is definitely settled, the main shaft will be continued to the requisite depth and an adit run to drain the channel.

In the construction of the tunnel, wash-gravel, of a very favourable appearance, was pierced and "prospects" of heavy gold were secured. The ground was also found to contain a large percentage of heavy, brown sulphurets. All indications, so far, point to a rich channel, and, as there is a very small amount of water to be handled, should pay gravel be found this would be a valuable property. There is a complete hoisting and pumping plant on the ground.

A complete hydraulic plant has been installed on this property with **Victoria Claim.** 900 miner's inches of water available. A run of thirty days was made last Fall to give the plant a thorough test and a partial clean-up was made, from which a very satisfactory, in fact flattering, return was had. The *Discovery Claim*, adjoining the *Victoria*, including ditches, buildings, etc., was purchased of the Houser Bros., and will be worked in conjunction with the latter claim.

When this property is equipped with the complete outfit, as proposed, it will have two pits, each of which will be served by two monitors. With the abundant supply of water which is available for a season of at least six months, an ideal dump, and a gravel bank that has been proved to be auriferous, in fact to be pay gravel, the success of this enterprise seems assured.

Late last Fall, a ditch with a capacity of 1,000 miner's inches was **Van Winkle Claim.** commenced. The early winter weather proving to be very open, and the fall of snow unusually light, this work was quickly completed. A flume, three-quarters of a mile in length, forming part of the ditch line, is now in process of construction, and will be completed in February, 1900. The water thus secured will reach the ground with a head of 218 feet. The pipe line and monitors are now on the way from Ashcroft, and will be installed in readiness for the early Spring water. This plant will also have two pits and two complete lines of sluice-boxes and undercurrents. It is proposed to handle both hydraulic plants night and day, and to this end an electric light plant is being erected, having a capacity of twelve 1,200-candle power arc lamps. As many as eighty men were employed by the management during the past season on construction work.

Before commencing actual development work, all of the claims were systematically and thoroughly prospected. Two thousand four hundred cubic yards of ground were washed in all, from which was obtained the very large sum of \$2,700. The Company has built an extensive camp, consisting of two residences for the respective managers, a large house for the employees, a stable, and root house. The property is located 14 miles off the main wagon road, and in order to expedite the delivery of the large amount of outfit *en route*, the Company has built 9 miles of sleigh road, making through connection with their camp.

Great praise is due the local management for the untiring zeal and ability displayed in completing in such a comparatively short time such an extensive installation.

THE CARIBOO DEEPS, LIMITED.

H. E. C. Carey, C.E. & M.E., Manager.

The property of the Bradford, Yukon and Cariboo Gold Fields, Limited, which is situated on Antler Creek and Nugget Gulch, has been acquired by this syndicate. A large amount of work has already been done, consisting of a drainage and working tunnel 450 feet in length. This tunnel, from the last 15 feet of which an encouraging prospect of gold was secured, will be continued to tap what is claimed to be the ancient channel of Antler Creek. The last work of the season consisted in running a cross-cut to the north rim, the tunnel having reached the rim on the south side. At the time of closing down for the season, the objective point had not been reached.

On Nugget Gulch the Company has run 85 feet of tunnel, and sunk a blind shaft for 20 feet. The object of this was to prospect the ground with a view to installing a hydraulic plant. This exploratory work will be completed during 1900, and if the yield of gold keeps up to the average so far maintained, a thoroughly equipped plant will be installed.

On Canadian Creek the Company proposes to exploit the deep ground, and to this end has built a shaft-house, in which will be erected the necessary plant.

THE WAVERLY COMPANY OF GROUSE CREEK.

Great credit is due the men constituting this Company for the persistent and vigorous manner in which they have carried on the development of their property for a number of years. The means have been furnished by local members, under the installment form of corporation. A first-class hydraulic plant is on the property, with all the necessary flumes, sluices, etc. At present the chief drawback is an insufficient supply of water. The Company has had a vast amount of unproductive ground to move before reaching the pay gravel. Most of the ground so far washed had been worked years ago by drifting, but another favourable season should bring them through this into virgin ground. From thenceforward, for many years dividends are confidently expected. In its present condition the claim about pays expenses.

THE WILLOW RIVER ENTERPRISE.

F. C. Laird, Manager.

This is another deep ground enterprise which has developed into a much more serious undertaking than was anticipated at the outset. Nothing but the courage of their convictions would keep those interested still delving away to overcome the few feet intervening between them and the channel of Willow River. As was done at Slough Creek, a series of holes was bored across the valley to measure the exact distance to bed rock in the channel, and this was located at 100 feet. An attempt was made to sink a shaft immediately over the gutter, but an overplus of water for the pumps foiled this. Then a tunnel was run into the hill to tap the rim-rock, with a view to sinking there and drifting out under the channel. Rim-rock having been met at a distance of 620 feet, an uprise, 6 by 12 feet in the clear, was made to the surface through 100 feet of clay and the shaft was then continued down through the rock for 112 feet. Leaving the last twelve feet for a sump, a tunnel was run back 600 feet to intercept the channel.

A fire, which destroyed the shaft-house and machinery, and the great difficulties encountered in breaking through from the rock into the channel, have prevented, so far, the consum-

mation of the enterprise. However, the prospects of gold secured from the borings and from the small amount of gravel taken from the channel in the unsuccessful attempts to break through, have inspired a determination to "stick to it" until the gutter is reached.

A complete and powerful plant of pumping and hoisting machinery is on the property, and nothing stands in the way of the successful prospecting of the ground except the difficulties of overcoming the few feet composing the passage from rim-rock to gravel. Work is being actively carried on, and it is hoped that the present winter will see the prospecting work finished.

THE CARIBOO MINING AND DEVELOPMENT COMPANY.

Messrs. H. B. Beecher, W. H. Ford and others, of New York, recently purchased this property, consisting of a mile and a half of what is supposed to be an old channel of Antler Creek. During the past season the Company was actively engaged in prospecting the ground, and announces that it is satisfied it has found the old channel, and confidently looks for rich returns during the coming season.

The work last season exposed about 100 square yards of bed-rock, from which sufficiently satisfactory returns were secured to warrant the installation, as early next season as practicable, of a hydraulic plant of ample proportions. The Company will also build next season a camp for employees, an office building and stables, and it is planned to sink a shaft, so that work may continue without interruption during the winter of 1900-1. The group of men controlling the property have an abundance of capital for development purposes, and their progress will be followed with much interest.

THE LIGHTNING CREEK GOLD GRAVELS AND DRAINAGE COMPANY.

Major Moore, Manager.

This Company holds concessions on Lightning Creek, granted it by Private Act (Chap. 56 of 1896) of the Legislature. The plan outlined by the Company at its inception was to run a drain tunnel up the valley on a water level until bed-rock was reached. After completing about 1,500 feet of this tunnel, they concluded that the most expeditious way of proving the ground was to sink a shaft in the rim-rock and drift out under the channel. A large shaft is now completed to a depth of 100 feet and after continuing this a short distance further the tunnel will be started. Three shifts are kept continually at work, under the management of Harry Jones, one of our oldest and most expert miners. The rock drilling is being done by hand, a large water wheel supplying the power for hoisting. A pump of large capacity is on the ground, and will be installed upon the completion of the shaft. The realization of the Company's expectations of rich returns will do much to stimulate the renewed interest in the deeper channels of the District.

THE PETERS CREEK GOLD MINING COMPANY.

J. G. Mathers, Manager.

This Company has been recently organized to exploit the deep ground on Peters Creek, a tributary of Lightning Creek. In the hands of Mr. Mathers, a Californian Mining Engineer, the thorough investigation of the property is assured. The erection of the necessary camp and buildings is now proceeding, and an outfit of machinery is at Ashcroft awaiting transportation.

This ground has been regarded for years as worthy of exploitation, and the efforts of this Company will be watched with interest.

THE SUTHERLAND HYDRAULIC GOLD MINING COMPANY.

B. A. Lasell, Manager.

This is a recently organized Company which has purchased two leaseholds on Fourteen-Mile Creek, a tributary of Bear River. The property is situated about thirty miles from Barkerville, off the waggon road. Before being taken over, the ground included in the leaseholds was thoroughly prospected, good prospects being obtained. The Company is still engaged in exploratory work preparatory to installing a hydraulic plant, which it is proposed to put in during the coming season; but as the outfit has not yet left Ashcroft, it is doubtful if it can be taken through in time. The development of this enterprise is watched with more than usual interest, as it is the initial step in a new section of the District hitherto practically unexplored.

THE INCORPORATED EXPLORATION COMPANY OF BRITISH COLUMBIA.

William Thompson, M. E., F. R. G. S., Managing Director. John Hopp, Local Manager.

This is one of the largest deep ground undertakings in the upper country. This Company acquired some time since the property of the Slough Creek Mining Company, consisting of several miles of the valley of Slough Creek. To this have been added a number of additional leaseholds on Slough Creek and Willow River, and a mile and three-quarters of Williams Creek, which latter embraces the ground the exploitation of which was unsuccessfully attempted by the Lane and Kurtz Company several years ago.

A number of holes were sunk by the Slough Creek Company across the valley of Slough Creek, by means of an artesian jetting machine, in order to determine the exact depth of the gutter of the old channel. Further boring was done by the new company, verifying the data secured by the former. It was also ascertained that, while there was a stratum of considerable depth totally impervious to water intervening between the surface and bed-rock, at the same time there was a considerable extent of soft ground, heavily impregnated with water, lying above the clay. It was accordingly concluded that the only sure way of reaching the objective point, the gutter, was to sink in the rim-rock, drift out to a point below the gutter, and break out into it from below. After careful consideration and thorough surveys, a spot was chosen on the north bench of Slough Creek as the most advantageous location for the shaft. It will be necessary to sink a shaft 362 feet in depth, and run a tunnel from the bottom of this shaft 1,060 feet, in order to intercept the ancient channel of the river. A splendid shaft-house, 42 by 76 feet, has been completed. As the rim-rock was not exposed, it was necessary to sink a shaft 4 by 6 feet to the water level, and thence to tunnel into the mountain 104 feet, at which point the rim-rock was reached at a point above water level. Here a main working shaft, in three compartments, has been sunk 50 feet from the surface to the rim-rock and 20 feet into the rock, consisting of a pumping compartment 4 feet 6 inches by 6 feet, and two hoisting compartments, each 4 feet by 4 feet 6 inches. The gross dimensions of the shaft are therefore 5 feet 4 inches by 15 feet 4 inches. The entire shaft is to be cribbed with sawed timbers, 4 inches in thickness. One thousand cords of wood have been delivered at the shaft-house.

Everything is in readiness for the plant which was ordered nearly a year ago from the James Cooper Manufacturing Company, of Montreal. The unusual demand for mining machinery, primarily, and then the condition of the waggon road, have prevented its arrival up to the present time. I am informed that it is now *en route*, somewhere between Ashcroft

and the mine. The plant, exclusive of the pumps, the exact details of which have not as yet been decided upon, consists of the following:—

- Two 40 horse-power return tubular boilers ;
- One Ingersoll-Sergeant, Class A, 10x12 air compressor ;
- One air receiver ;
- Two Sergeant rock drills ;
- One 8½x10 double cylinder, single drum, hoisting engine ;
- One 12½-inch outlet exhaust fan ;
- One high speed engine of 65 horse-power ;
- " " 15 "
- Complete set of blacksmith and engineers' tools ;
- " " duplicate parts for entire plant.

Immediately upon the installation of this plant, the arrival of which is hoped for at an early date, work will be commenced and pushed to completion with all possible speed. Situated as this company is, with competent management and ample funds at its disposal, it may reasonably be expected that the large amount of work ahead will be disposed of quickly and in a workmanlike manner. There is every reason to anticipate a most successful issue to this enterprise, and should it realize the hopes and anticipations of those directly concerned and of all the residents of the upper country, it will doubtless give a strong impetus to drift mining.

THE CARIBOO EXPLORATION COMPANY, LIMITED.

Samuel Medlicott, Manager.

This Company has acquired two groups of claims along the benches of Slough Creek. One group comprises the ground between Nelson and New Creeks, and the other that between Burns and Jack of Clubs Creeks. The *Burns Creek Group* takes water from Jack of Clubs Creek in a ditch of 2,000 miner's inches capacity, 5½ miles long, included in which is a long stretch of flume. Late last fall, all preliminary work having been finished, the water was turned into the ditch, with a view to having it fully puddled and any possible weak spots exposed. During this operation a very respectable pit was opened, so that everything is in perfect condition for piping with the first spring water.

The large amount of water at the Company's disposal will admit of three monitors, each with a 4½-inch nozzle, being worked continuously during the season, which, in this case, will extend from frost to frost. These monitors are now in position, ready for the water. The water will leave the monitors under a 250-foot head. The Company is fortunate in having an almost perfect dump. In the matter of camp, as well as in all other details of the plant, the idea of permanency is apparent. Three large and well-built houses, a stable and blacksmith shop comprise the buildings.

The *Nelson Creek Group* has a somewhat smaller plant, comprising a ditch of 800 miner's inches capacity, one mile and a half in length, reaching the monitor under a head of 300 feet. One 4½-inch monitor will be used. The work of opening up a pit was begun last spring, and a most creditable showing in the way of ground moved was made. For the first season's work an amount of gold was secured sufficient to satisfy the Company that, when the plant gets into perfect working shape and a large pit is opened, the enterprise will become a steady dividend payer.

THE DEVIL'S LAKE GOLD MINING COMPANY.

This Company is composed of individual miners, and has as its object the prospecting of an ancient channel, which, there is every indication, crosses the canyon under the lake. The

members have done a great deal of hard work on the property, including a rock tunnel nearly 400 feet in length. At present the tunnel has reached gravel, but, from the dip of the rock, it is estimated that it will have to be extended several hundred feet before the channel is reached.

THE CORNISH CREEK ENTERPRISE.

H. W. Laird, Manager.

For many years there has been a strong feeling among the old timers of this neighbourhood that the deep ground on Cornish Creek was well worth prospecting. Twenty years ago, or more, a number of attempts were made to reach the channel by means of shafts, the remains of which are still to be seen. The cause of failure invariably was inability to cope with the water with the crude facilities then available. Last fall, the above syndicate set about the work on a plan that bespeaks success. In addition to a commodious camp, a splendid, large shaft-house has been built. The creek has a good grade, so that but a short ditch was required to bring to the shaft-house a sufficient amount of water to generate about 30 horse-power. An overshot water-wheel 18 feet in diameter has been erected in the shaft-house, and this will actuate a Cornish pump 10 inches in diameter. Everything about the plant, so far as completed, is first-class. A shaft, 5 feet by 8, was sunk to a depth of 25 feet, and, by the time this work was completed, the winter season having set in, it was deemed advisable to await the arrival of spring before attempting anything further.

Cornish Creek is one of the tributaries of Willow River. In addition to the generally favourable lay of the land and that gold has been found in the shallow ground at its source, the further fact that almost every tributary of Willow River that has been prospected has yielded gold in paying quantities is a strong point in its favour. The great interest awakening in the District is evidenced by the exploiting of this and a number of other locations which have been regarded as favourable but have hitherto lain undeveloped.

The *Alabama* and *Discovery Claims*, of Mosquito Creek, and the *Black Jack Claim*, of Williams Creek, ranking among the smaller hydraulic enterprises, were worked as usual during the past season, and yielded their customary quota of gold dust. These companies are of long standing, and if the newer companies which propose to work on a large scale can be made to pay such dividends as these have, in proportion to capital invested, they will be successful in the highest degree.

THE SLOCAN-CARIBOO MINING COMPANY.

H. T. Windt, Manager.

This is a company composed of some prominent business men of Ontario. Having acquired two mining leases on Canadian Creek some two years ago, Mr. Windt was sent out to superintend development work, which has been carried on in a small way to determine the best method of working the concessions.

I am now informed that it is the intention of the Company to work the mine by the hydraulic process. To this end it has purchased the old *Clear Grit Real Estate Claim*, through which the Company must run to reach its own property. A hydraulic plant of requisite capacity will be installed during the coming year, and if a sufficient water supply can be obtained the success of the Company is assured.

 THE QUESNEL DIVISION.

THE COLUMBIA GOLD MINING COMPANY.

The energy displayed by this Company—which holds large and probably valuable concessions on the Quesnel River—at the inception of its enterprise has lain dormant for several years.

The work so far done by the Company consists of expert examinations of the ground and the survey of ditches for bringing water to the property for a hydraulic plant.

THE COTTONWOOD ALLUVIAL GOLD MINING COMPANY.

This Company, holding a series of claims on the Fraser River below the mouth of the Cottonwood, has now, as a result of its labours in former seasons, a complete hydraulic plant ready for work as soon as the season opens. It carried on vigorously, during the past season, the work of repairing its ditch line, a slide having occurred which carried away a large part of it, necessitating the building of a long and costly length of flume. There is every prospect, I learn, of this property developing into a valuable mine.

THE C. J. SEYMOUR BAKER COMPANY.

Mr. C. J. Seymour Baker, C.E. and M.E., acting for London capitalists, has continued his exploratory work during the past season on West Creek, a tributary of the Fraser River some twenty miles above the town of Quesnel. He has also carried on prospecting on the *Scandinavian* and *Occidental* leaseholds on the Quesnel River. This gentleman is impressed with the fact that valuable quartz ledges exist in the District, and has been devoting considerable attention to the matter. During the season just closed, he has had a good deal of work done on certain ledges, and is hopeful that he may develop some of them into mines.

THE GOLDEN PROVINCE MINES COMPANY.

This Company has made no move during the past year to continue the work of endeavouring to prove the existence of a gold-bearing channel of the Quesnel River which, according to its theory, passes through the mountain of basaltic formation bordering on Baker Creek. The workings are situated across the Fraser River, about three miles west of Quesnel. A great deal of criticism has attached to this undertaking from its inception. The Company has lately been doing some exploratory work on placer ground held by it on Hixon Creek, but I am not advised of the result of this work.

RIVER DREDGING.

This method of gold mining in the Cariboo District offers to the capitalist a field almost without limit. The Fraser, Quesnel, Cottonwood and Willow Rivers together offer an area sufficient to float gold dredgers equal in numbers to the British Navy. I think it may be stated as an absolute certainty that the four rivers above noted carry deposits of gold in paying quantities in the greater portion of their length. Quite an array of companies felt so well assured of this that they have installed dredges at an enormous outlay of money, and claim to have positively established the fact that the beds of the streams on which they are operating are rich in gold deposits.

The conditions they have had to meet, however, up to the present, have proved, with possibly one exception, that the types of machines they have provided are not what are required to cope with nature in her Cariboo mood. The one exception noted is that of the North-West Dredging Company of Tacoma, Wash., under the management of Mr. C. M. Seeley. This Company has probably approached nearer the ideal with the dredge it has built than has any other. This dredge is of the elevator type, and while built with the sole view to determine

whether or not it was of the proper design to be operated in the swift current of our rivers, and being accordingly of small proportions, has proven to the entire satisfaction of the management that it has hit upon the proper form of machine. Mr. Seeley has positively assured me that while in actual operation the dredge did all that was expected of it, although, owing to the fact that it was built for experimental purposes, many details of its construction were found to be too light for the heavy work required of it. These defects, however, the Company will amply provide for in the large dredge it contemplates placing on the property in the near future. After most painstaking research the Company has also installed an apparatus for saving the fine gold (in which form it appears almost exclusively in our rapid rivers), which is claimed to be the most perfect yet discovered.

THE NEW ENGLAND DREDGING COMPANY.

This is one of the newer dredging companies. Its property is situated on the Quesnel River, ten miles below where the north and south branches join. It has well under way one of the largest and most complete dredges, of the elevator type, in the Province, which differs, however, in construction from any at present in use in these parts. The machinery entering into its construction is of the heaviest type, and no expense or trouble has been spared to make it in every respect a model dredge. From these facts the greatest interest is displayed in the operations of the Company. It is a source of regret that the commendable exertions of the management to have everything in readiness for beginning actual dredging as early in 1900 as the river will permit bid fair to be of no avail, owing to the fact that it has been impossible to move parts of the heavy plant over the waggon road. Some of these parts are now lying along the roadside at different points waiting for a passable condition of the roads.

THE NEWALL DREDGING COMPANY.

This Company has been working its small dredge, during the season, near Quesnel Forks at such times as the condition of the river permitted dredging operations. The result of the season's work is, as yet, unknown to me.

(NOTE BY PROVINCIAL MINERALOGIST.—Mr. Newall has informed me personally that his work this past season was purely experimental and exploratory, and that, while he was perfectly satisfied from his season's work that gold existed there in as sufficient quantities as he had hoped, still he was as yet not quite so certain as to the best means of saving same,—both as regards plant and mode of working. He is, however, to continue his operations next season, and is sanguine of ultimate success.)

THE PITTSBURG AND CARIBOO DREDGING COMPANY.

This Company, as was intimated in my Report of last year, owing to untoward circumstances was prevented from prosecuting its work during the season of 1898. Everything was gotten in readiness last spring for a thorough season's work. Operations were begun on the Company's claim on the Fraser River, near Cottonwood Canyon. After prosecuting the work there for some time, and results not meeting the expectations, the dredge was moved down stream about six miles below the town of Quesnel. At this point is situated what is known as Rich Bar. By the time all was in readiness for work the season was far spent, and the water in the river was low; I am informed, however, that during the short time left for actual work very satisfactory results were obtained. The Company uses the "dipper type" of dredge, and has a large and well appointed machine.

THE HALL DREDGING COMPANY.

The dredge operated by this Company is similar in some particulars to that of the North-West Dredging Company. Work has been carried on during the past season, but I have not been able to learn the result.



SHOWING FLUME CONSTRUCTION.



SHOWING DITCH.



SHOWING DITCH THROUGH BAD GROUND.
43RD COMPANY'S FLUME AND DITCHES—OMINECA M. D.



METALLIFEROUS MINING.

Cariboo District is cut by two mountain ranges, the Rocky and the Cariboo, the former shaping a course from south-east to north-west in the eastern portion of the District, and the latter extending with a similar trend through the central part. The Gold Range, which is made up of several more or less definitely outlined ranges, of which the Cariboo Mountains form the most important, is acknowledged to be the most interesting, as regards gold deposits, in the Province. The richest placers have been discovered lying contiguous to it and those parts of it which have come under the scrutiny of the careful prospector have been found to contain metal-bearing veins. It is but reasonable to infer that the historic wealth of the Cordillera belt in United States Territory will be found in a comparative measure within the Province and in this District. This inference is made stronger, as regards the Cariboo District, by the rich discoveries made in these ranges in the south-eastern portion of the Province in the Kootenays. While, however, in the Cordillera belt, extending through California, the gold-bearing district is confined to one well-developed locality, in this Province metalliferous veins have been found from Cassiar District to the International Boundary. This is another reason for the expectation that these ranges, throughout their course in the Province, will richly repay the prospector for his investigation.

One factor, although by no means the chief, which has retarded the mineral development of Cariboo District is the effect of the glacial age whereby, throughout a considerable part of it, large tracts have been covered to a greater or less extent with drift deposits which render the work of the prospector rather more difficult than usual. Yet in some localities the sure proof of near at hand gold-bearing ledges is so conclusive that it seems unaccountable that thorough and persistent search is not made to locate them. The proof to which I refer is the occurrence in such large quantities of heavy gold in the deep channels. This, I maintain, may be regarded as conclusive evidence that the initial source of the gold is close at hand. It is a well-known fact that heavy gold travels but a short distance. Moreover, many of the nuggets found are of a very fragile nature; and others are found imbedded in quartz. It is the invariable experience of California and Australia that placer and vein mining are coincident. It has been asserted by some, basing their judgment, however, on a most cursory examination, that the veins in the Barkerville Division are too irregular and too much broken up to be profitably handled; and while the gold yielded by the placer diggings probably owed its source to veins in close proximity, it came, not from any well-defined ledge, or collection of rich ledges, but from a concentration, wrought by nature, of a great mass of comparatively barren rock too poor to be mined. I regard this position, in view of the phenomenally large yield of such localities as Williams Creek (yield from two and one-half miles, \$20,000,000), Mosquito Creek (yield from about one and one-quarter miles, \$3,500,000), and Lightning Creek (yield from about two miles, \$12,000,000), as entirely untenable.

It is with regret that I am compelled to state that quartz mining is almost entirely dormant in the District at the present time. For years I have felt convinced that Cariboo merited better attention in this respect, and have used every endeavour to bring into prominence its advantages.

Circumstances, however, seem to militate against us, the factor of prepondering weight being our distance from a railroad, and the consequently slow, unsatisfactory, and expensive transportation facilities. Notwithstanding this most serious barrier, there have occurred at times spasmodic feelings of interest, especially in 1878 and 1879 when quite an excitement arose which, however, as quickly subsided, and this sudden birth and as sudden death acted as a detriment rather than a benefit.

Very promising ledges have been discovered and located on Burns Mountain, Island Mountain, Porcupine Mountain, and Snowshoe Plateau, besides in many other localities. The development work that has been done on most of these would be regarded, in quartz mining districts, as practically no work at all but it is well within the probabilities that amongst them may yet be found the making of mines.

Eminent geologists, who have visited Cariboo, have unanimately expressed their confidence in its ultimate future as a quartz mining country, and it is to be hoped that the wide spread interest which is now being taken in the mining affairs of the District will not be confined to placer deposits, but that quartz mining will receive that attention which I believe it fully merits.

SUMMARY.

I have endeavoured in the preceding to give concise descriptions of the operations of the placer branch of the mining industry, and to submit some remarks on the subject of our quartz interests. It has been impossible to treat of all the enterprises fully, both from lack of space and the absence of data, but the operations of those referred to will serve as an exemplification of the solid and sure advance of the District.

The largest producers of gold during the past year were the Cariboo Consolidated Hydraulic Mining Company, the Horsefly Gold Mining Company, the Alabama Company of Mosquito Creek, the Cariboo Consolidated of Williams, Lowhee, and Lightning Creeks, and the Black Jack Company of Williams Creek. There are, of course, many small companies both of whites and Chinese working in different parts of the District, all of which have produced their quota, the output of the Chinese companies being nearly one-half the total yield from such sources.

Collecting information from the most reliable sources obtainable, I estimate the total output of the district for 1899 as follows:—

Barkerville Polling Division	\$ 85,000
Lightning Creek "	37,000
Quesnel "	28,000
Keithley Creek "	160,000
Total	\$310,000

There have been issued during the year:—

Free Miner's Certificates	590
New Mining Leases—Hydraulic	67
Creek	68
Dredging	11
—	146
Placer Claims recorded	208
Mineral "	94
Certificates of Work	28
Water Grants for mining purposes	63

Although there has been quite a reduction in the number of Free Miners' Certificates issued for the year, yet the revenue received from all sources makes a very satisfactory showing, exceeding that of any previous year in the history of the District.

QUESNEL MINING DIVISION.

The following report on the Keithley Creek District has been received from Mr. Wm. Stephenson, Mining Recorder at Quesnel Forks.

The water supply for the season has been good, in fact much above the average, and hydraulic miners have no cause for complaint *re* water supply in this section. On the other hand, those waiting for low water to enable them to get at the bottom of river and creek beds, had a very short season's work, and in some cases could not work at all as, owing to the amount of rain during the summer, all streams kept at a higher stage of water than usual.

As a whole, judging from the amount of gold obtained, the results of the season's work have not been as satisfactory as anticipated. The very early frost in October closed the hydraulic mines on Keithley and Snowshoe Creeks before some of them had cleaned up for the season's work, and although the weather was mild afterwards these did not resume work and therefore are short of results for the season. Likewise some of the best mining propositions in this section, owing to accidents and other circumstances, have not realised expectations as to the season's yield of gold.

Although matters are not as favourable as expected, yet there has been a great deal of work done by a number of new companies in the way of getting machinery on to their different properties for further operations, both in the Quesnel Forks and the Horsefly sections of this Mining Division.

The good results of the Horsefly Gold Mining Company's season's work, as well as the success of the Miocene Company in reaching bed-rock with its shaft, have caused quite a stir in the Horsefly section in the way of new locations, which presumably means more work during the coming season.

Dredging propositions now seem to have interested quite an amount of capital in this section, as two dredges have been built during the season for working on the upper part of the main Quesnel River, one being built at Quesnel Forks and the other at a place seven miles lower. The one built at the Forks was floated down the river to the place of operation and worked for a short time during the latter part of the season, with, I am told, good results for the amount of work done. The one built seven miles below the Forks has not yet been launched; the cold weather set in and all the machinery not being on hand it was concluded not to launch the boat until next spring. This latter is a large boat 80 feet long by 40 feet wide.

Next season will probably see a considerable amount of dredging work done on the upper part of Quesnel River, and should the machines prove to be of the right kind there is little doubt of satisfactory results.

Re Mineral Claims there is nothing to report for the year, with the exception of three new locations and certain assessment work; no efforts have been made to develop any claims.

OMINECA DISTRICT.

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OMINECA LAND RECORDING DISTRICT.

REPORT BY FRED. W. VALLEAU, GOLD COMMISSIONER.

SIR,—I have the honour to submit this my second annual report upon the Omineca Mining Division.

While there have not been so many applications for mining leases this season as last, there has been much more actual development work performed than ever before in the history of the District. This past spring was exceptionally late in opening, while unusually heavy rains and a lower temperature than previously recorded have retarded the progress of work in the District very much.

Following is a short description of what is being done by the principal companies operating in this District:—

THE 43RD MINING AND MILLING COMPANY.

The 43rd Mining and Milling Company has this year completed its development work, and now has in place a most complete hydraulicizing plant. This Company owns twenty-four leases of ground on Manson, Slate and Kildare Creeks, and its ditch and flume line commands all of this ground. The following is a description of the work done by this Company, taken from the report of its Engineer, Mr. Cotton:

In 1896 active operations were commenced, and since that time over six miles of ditch and flume have been built. Of this length, 20,250 feet is ditch of the following dimensions: Bottom, 4 feet; top, 10 feet; depth, 3 feet; grade, 8 feet to a mile. In building this ditch, 45,160 cubic yards of earth were moved. In constructing the 15,150 feet of flume, 6 feet wide, 3 feet deep, grade 10 feet to the mile, over 363,000 feet of lumber were used. This ditch and flume are capable of carrying 3,500 inches of water. The Company has a well-appointed saw-mill, at which all lumber and timber used has been sawn. Several buildings have also been erected for the use of the large number of men employed. Six miles of first-class waggon road has been made; telephone lines and an electric light plant have been installed. Several thousand feet of steel pipe and a hydraulic (Evans) elevator are in position and thoroughly tested. The amount expended up to the present time is over \$200,000.

THE ST. ANTHONY COMPANY, OF SANTA BARBARA, CAL.

The St. Anthony Company is now expending large sums of money putting its property into working order. This Company is a close corporation, and has bought from the Omineca Consolidated Company, Ltd., eight leases on Germansen Creek, and has also taken up ground on Manson and Evans Creeks. Large quantities of supplies and provisions have been brought into the District, and a large force of men has been employed building the ditch line on Germansen Creek. Four miles of waggon road have been built, quantities of lumber sawn, and, in fact, every indication shews that the Company means to put its property into working order as soon as possible. The St. Anthony Company also owns eight miles of the bed of Germansen Creek, which will be commanded by the ditch in course of construction.

Evans Creek, also owned by this Company, has been prospected this past season. The Company, at its own expense, has cut 16 miles of trail in to its property. I have not heard definitely what prospects were obtained, but I understand they were very satisfactory.

THE ARCTIC SLOPE MINING COMPANY, OF VICTORIA, B. C.

This Company has acquired all the property formerly held by the Omineca Consolidated Mining Company on Manson, Black Jack and Lost Creeks, and at Pete Toy's Bar, on the Findlay River. This past season work in a small way was carried on at the mouth of Black Jack Gulch, by means of a cotton hose and nozzle. This ground has proved to be exceptionally rich. The Company proposes next year to put in a proper hydraulic plant, in to work its property on a large scale.

EVANS CLAIM—MANSON CREEK.

The old Brown Company's claim has been worked by Mr. Evans, one of the "old timers" of the District, and this season the property paid very well. This claim is situated about one-half mile below the mouth of Kildare Gulch and consists of 300 feet of the bed of Manson Creek.

AH LUM CLAIM.

Lower down Manson Creek another claim has been worked by Ah Lum, a Chinaman, who has employed two or three men all the season, but it is almost impossible to find out what returns he has had.

Several gentlemen from Petrolia, Ontario, took up four leases of ground on Manson Creek two years ago, but nothing whatever has been done to represent these leaseholds, and the lessees have been notified that they have been cancelled.

LOST CREEK.

Charles McKinnon's two leaseholds have been worked steadily by him this past season, but the work done has been mostly development, such as building a ditch and a bed-rock flume for drainage purposes, some 300 feet in length by 4 feet wide, running to about 10 feet in depth. Although this bed-rock flume has been constructed through ground already worked by the old timers, it has given returns sufficient to pay all the labour expended upon it. Mr. McKinnon intends working this ground next season with a small hydraulic plant (hose and nozzle) and I expect to hear of very good returns from this claim.

PURVIS COMPANY.

This Company, composed of four practical miners, has taken up a creek lease of one-half mile of the bed of Lost Creek. The Company has done a great deal of development work under very adverse circumstances, and so far has not had very encouraging returns, but is hopeful of doing much better next season.

Eight leases, above the McKinnon Claim, were taken up by some gentlemen from Ashcroft in 1898, but up to the present time no work has been performed upon their ground. They have been notified that unless the rents and twenty-five per cent. of the amount required to be expended in development work are paid in cash, these leases will be declared cancelled.

TOM CREEK.

May Flower Claim, owned by Messrs. May and Lyon, is being developed by cutting a deep bed-rock flume, up stream from the Canyon, some two hundred feet long and from twelve to sixteen feet deep. This work has cost a large amount of money and has taken all the season to complete. The owners hope to be in a position to begin actual mining in the spring.

There are also two other claims being worked on this creek, by an Indian and a Chinaman respectively.

VITAL CREEK.

The Caledonia Mining Company, of Nanaimo, has been prospecting its ground all this past season by sinking shafts to bed-rock, and intends putting in a plant this coming season to work the property, being, I believe, very well satisfied with the prospects obtained.

An English syndicate, represented by Dr. Powell, of Victoria, has bought out the Chinese Company's claims on this creek, and has also taken up two leaseholds. An engineer and party have been examining the ground this season, and matters will be pushed next spring, putting it into working order.

OMINECA RIVER.

Some prospecting has been done on the bars in this river, principally above the Black Canyon. Rockers and long-toms were used. The gold recovered is very fine, but has paid from \$1 to \$3 per day.

FINDLAY RIVER.

About 75 or 80 men wintered at Fort Grahame this past winter ('98-'99), overtaken by snow on their way to the Klondike by way of the Edmonton Trail. When they reached Fort Grahame, in the Fall, they had altogether 331 horses, but between then and Spring some 300 died. About eight or ten of these men pushed on to the Klondike in the Spring; the others returned home either by way of Edmonton, the Parsnip River, or of Manson. None of them, that I saw, gave favourable reports of the Findlay River or its branches, but they admitted they did little or no prospecting. They reported ten cases of scurvey at Fort Grahame and at the different camps along the river, and I have heard since that one or two cases proved fatal.

MAY CREEK.

May Creek, a tributary of the Oslinca River, has been prospected for the past two seasons by Mr. Vanosta, on behalf of an English syndicate. This season he has located and been granted four creek leases. He reports the ground as being very rich, and proposes putting in extensive works next season.

PEACE RIVER.

Placer mining is being carried on upon the bars of this river and its tributaries by men coming into the District by way of Edmonton, who do not take out free miners' certificates, but as there is no trail connecting Manson with the Peace River, I have been unable to reach them to make any collections. I would, therefore, respectfully suggest that Deputy Mining Recorders be appointed, both at Fort Grahame and Fort St. John, for the convenience of prospectors and miners, as well as to collect all revenue due to the Government.

I beg to append a weather report prepared and kept by the 43rd Mining and Milling Company at its office, Manson Creek, from 1st October, 1898, to 30th September, 1899, as giving some idea of the climate.

OFFICE STATISTICS—OMINECA DIVISION.

Free Miners' Certificates.....	\$ 276 30
Revenue Tax.....	198 00
Mining Receipts General.....	7,696 40
	<hr/>
	\$8,161 70

WEATHER REPORT.

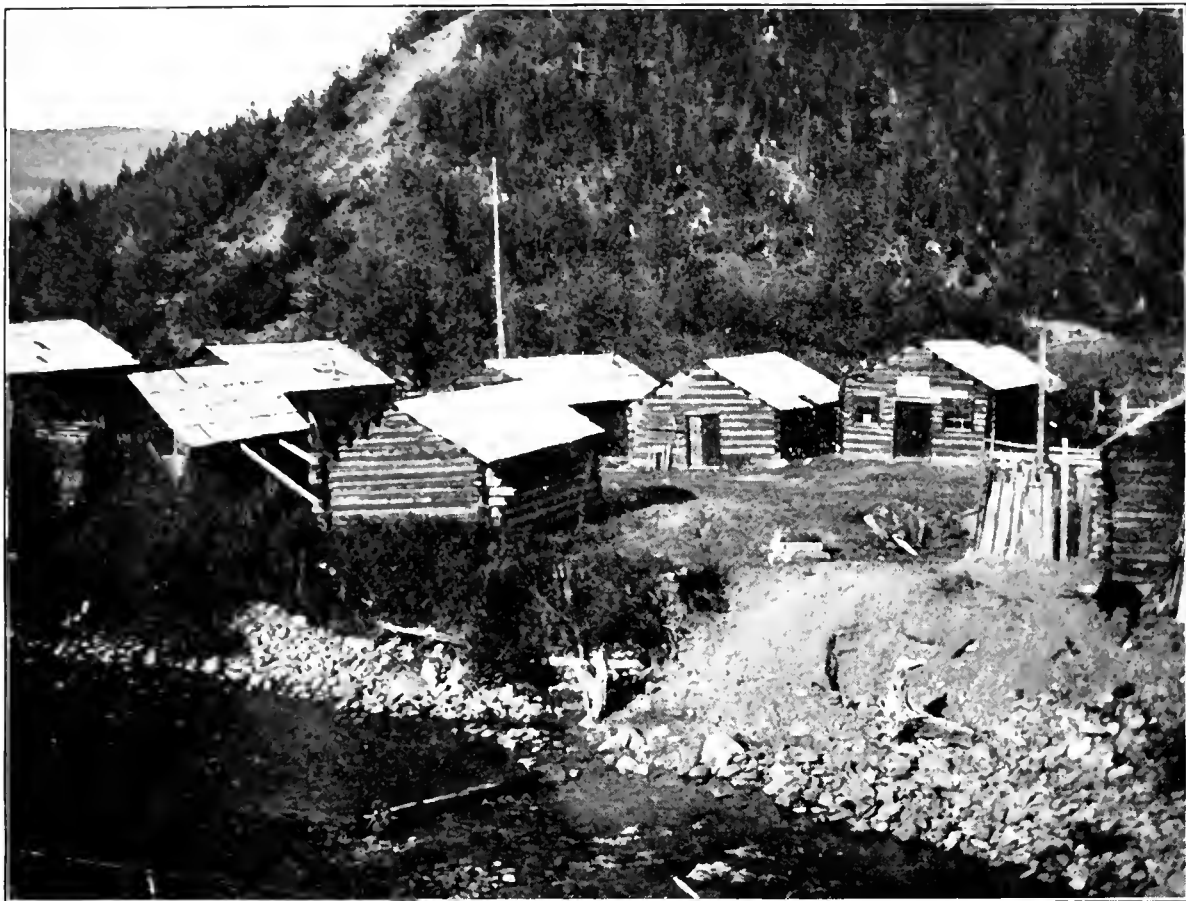
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Manson Creek, Omineca District.

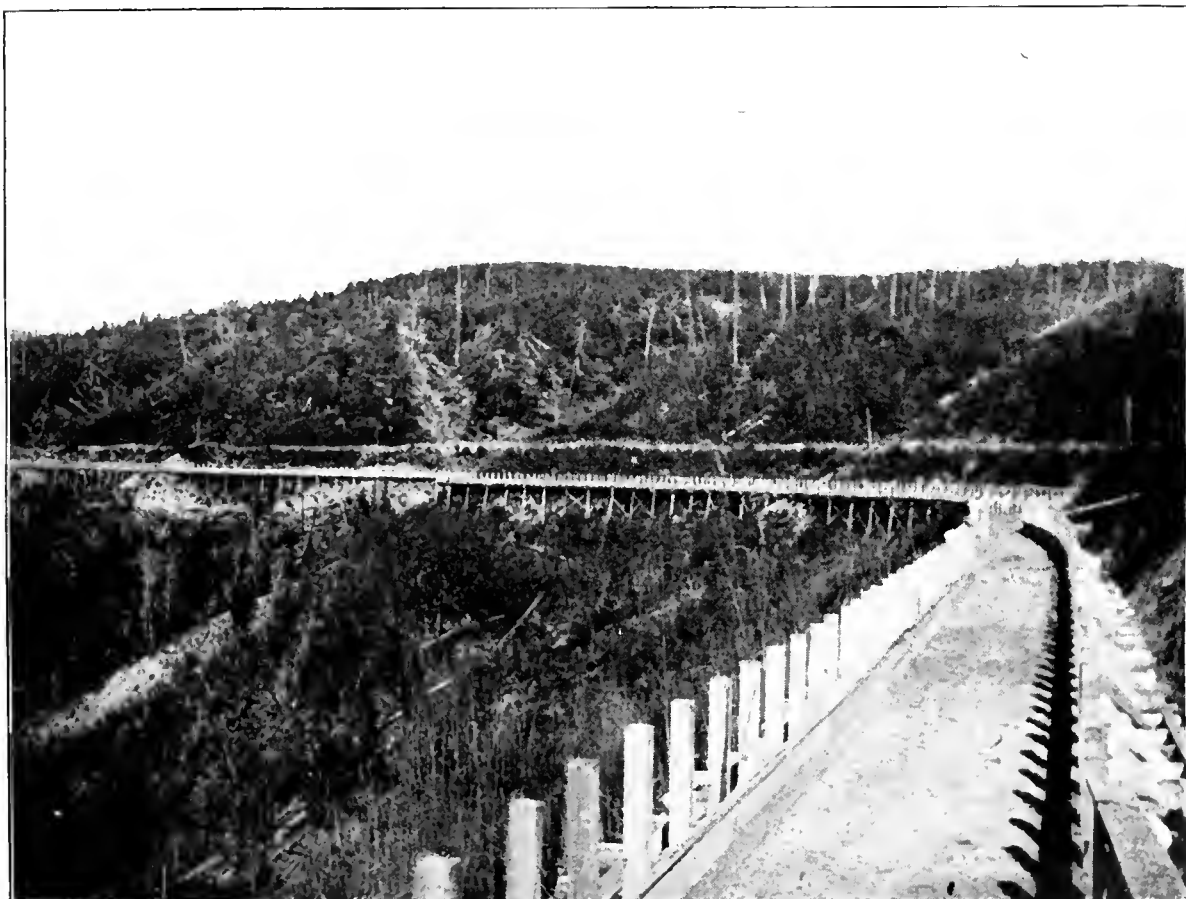
FROM OCTOBER 1ST, 1898, TO SEPTEMBER, 30TH, 1899.

1898.	6 a.m.	Noon.	6 p.m.	Remarks.
	0	0	0	
Oct. 1	25	30	25	Snowing.
" 2	20	25	22	Stormy. Snow.
" 3	16	24	22	Cloudy and snow. S. W. winds.
" 4	14	38	28	Clear. S. W. winds.
" 5	12	38	28	" "
" 6	12	46	32	" "
" 7	15	39	37	" "
" 8	28	32	36	Stormy. Snow.
" 9	29	35	33	" "
" 10	29	34	32	" "
" 11	32	39	33	" "
" 12	28	39	34	" Rain.
" 13	34	38	30	" "
" 14	32	40	32	Clear.
" 15	17	36	28	" S. W. winds.
" 16	16	34	31	Cloudy. "
" 17	32	34	31	Stormy. Snow.
" 18	20	34	30	Cloudy. Clear p.m.
" 19	18	34	32	Stormy. Snow.
" 20	30	34	29	" "
" 21	11	30	28	Clear.
" 22	7	28	27	" Windy. S.
" 23	20	28	27	Cloudy. S. W. winds.
" 24	19	23	28	Stormy. Snow.
" 25	29	32	28	" "
" 26	32	35	34	" "
" 27	28	34	32	Cloudy.
" 28	19	36	30	Stormy. Snow.
" 29	34	36	30	" "
" 30	31	40	29	" "
" 31	23	35	25	Clear.
Nov. 1	25	30	28	Stormy. Snow.
" 2	9	20	19	" "
" 3	18	28	24	" "
" 4	16	30	24	" "
" 5	12	26	22	" "
" 6	-10	10	-6	Clear.
" 7	6	12	10	" "
" 8	8	10	13	Stormy. Snow.
" 9	20	34	33	" "
" 10	17	36	30	Clear.
" 11	24	35	25	" "
" 12	18	26	26	Clear. S. W. winds.
" 13	33	34	33	" "
" 14	20	33	29	" "
" 15	22	35	37	Cloudy.
" 16	24	30	25	Stormy. Snow.
" 17	20	30	15	" "
" 18	2	26	-12	" "
" 19	-14	-6	-20	Clear. S. W. winds.
" 20	-40	-21	-29	" "

1898.		6 a.m.	Noon.	6 p.m.	Remarks.
		0	0	0	
Nov.	21.....	-42	-10	-17	Clear.
"	22.....	-38	-10	-12	"
"	23.....	-36	-20	-18	Cloudy.
"	24.....	-32	-22	-10	Stormy. Snow.
"	25.....	-4	20	-10	" "
"	26.....	-7	10	-8	" "
"	27.....	-4	10	-18	" "
"	28.....	12	27	21	Cloudy.
"	29.....	-11	-10	-15	Stormy. Snow.
"	30.....	-18	-13	-20	"
Dec.	1.....	13	23	-20	Clear.
"	2.....	-11	19	12	Stormy. Snow.
"	3.....	-13	22	-14	" "
"	4.....	-7	-11	0	Clear.
"	5.....	-8	-2	-8	"
"	6.....	-3	-20	-27	"
"	7.....	-13	-5	-6	"
"	8.....	-13	-8	-6	"
"	9.....	-6	10	0	"
"	10.....	-6	-4	-10	"
"	11.....	-20	-10	-18	"
"	12.....	-20	-7	-15	"
"	13.....	-16	-3	-4	"
"	14.....	-2	11	5	"
"	15.....	22	30	25	"
"	16.....	25	27	27	Stormy. Snow.
"	17.....	22	25	21	" "
"	18.....	22	28	24	" "
"	19.....	21	28	25	" "
"	20.....	19	25	23	Clear.
"	21.....	15	24	11	Stormy. Snow.
"	22.....	-4	4	4	Clear (sun rose 10.50 a.m.; set at 2.10 p.m.)
"	23.....	14	24	18	Stormy. Snow.
"	24.....	25	30	29	" "
"	25.....	22	27	25	" "
"	26.....	16	28	32	" "
"	27.....	28	33	25	" "
"	28.....	-7	-3	-30	" a.m. Clear p.m.
"	29.....	-23	-11	-32	Clear. S. winds.
"	30.....	-43	-16	-33	" N. E. winds.
"	31.....	-48	-39	-42	" "
1899.					
Jan.	1.....	-36	-24	-30	Clear.
"	2.....	-34	-23	-30	"
"	3.....	-40	-23	-30	"
"	4.....	-26	-18	-33	"
"	5.....	-38	-24	-33	"
"	6.....	-43	-36	-36	"
"	7.....	-18	-8	-5	"
"	8.....	-14	-21	-18	Stormy. Snow.
"	9.....	-10	-12	-8	" "
"	10.....	2	8	8	" "
"	11.....	25	24	12	" " S. W. winds.
"	12.....	18	24	22	" "
"	13.....	22	23	22	" "
"	14.....	18	21	2	" "
"	15.....	-18	-2	-10	" "
"	16.....	10	22	25	" "
"	17.....	22	25	28	" "
"	18.....	26	34	27	" "
"	19.....	23	32	13	" "
"	20.....	27	34	32	" "
"	21.....	26	25	0	" "
"	22.....	5	20	18	" "
"	23.....	20	28	25	" "
"	24.....	24	31	30	" "
"	25.....	22	22	29	" "



MANSON—MANSON CREEK—OMINECA M. D.



43RD CO.'S MAIN FLUME—OMINECA M. D.



1899.		6 a. m.	Noon.	6 p. m.	Remarks.
		o	o	o	
Jan.	26.....	14	28	24	Clear. High winds S.W.
"	27.....	30	46	46	" " "
"	28.....	10	26	28	Stormy. Sleet.
"	29.....	20	22	18	" Snow.
"	30.....	0	14	-4	Clear.
"	31.....	-28	-4	-14	"
Feb.	1.....	-38	-10	-29	Clear. N.E. winds
"	2.....	-42	-30	-44	" "
"	3.....	-44	-37	-39	" "
"	4.....	-36	-22	-29	" "
"	5.....	-34	-8	-4	" "
"	6.....	-8	8	-4	Stormy. Snow.
"	7.....	-6	0	-4	" "
"	8.....	-14	13	0	Clear.
"	9.....	-2	0	-6	Stormy. Snow.
"	10.....	-12	-2	-9	" "
"	11.....	-18	-4	-11	" "
"	12.....	-4	26	29	" "
"	13.....	24	30	28	" "
"	14.....	28	33	34	" "
"	15.....	32	33	33	" "
"	16.....	18	30	26	" "
"	17.....	20	37	31	" "
"	18.....	30	34	33	" Sleet.
"	19.....	26	32	18	" "
"	20.....	0	18	-11	Clear.
"	21.....	-38	-28	-32	"
"	22.....	-14	0	-2	"
"	23.....	-6	2	-4	Stormy. Snow.
"	24.....	-16	8	-9	" "
"	25.....	-42	-13	-18	Clear.
"	26.....	-14	-10	-14	Stormy. "
"	27.....	-20	7	-7	" "
"	28.....	-10	0	-7	Clear.
March	1.....	-10	-10	-24	Clear.
"	2.....	-24	-2	-9	"
"	3.....	-18	-4	-9	"
"	4.....	-35	8	6	"
"	5.....	-18	-24	-32	Stormy. Snow.
"	6.....	24	39	26	" "
"	7.....	-4	26	18	" "
"	8.....	-4	16	-4	Clear.
"	9.....	-24	6	9	"
"	10.....	8	26	20	"
"	11.....	10	26	14	"
"	12.....	12	22	18	"
"	13.....	0	18	2	"
"	14.....	-7	10	-6	"
"	15.....	-18	26	6	"
"	16.....	20	26	4	"
"	17.....	-4	29	24	"
"	18.....	-11	18	8	Stormy. Snow.
"	19.....	-14	12	2	Clear.
"	20.....	-4	10	-5	"
"	21.....	-30	12	-3	"
"	22.....	-18	9	-8	"
"	23.....	-14	13	2	"
"	24.....	-13	13	10	"
"	25.....	-2	21	12	"
"	26.....	0	25	25	"
"	27.....	20	24	19	"
"	28.....	8	29	19	Stormy. Snow.
"	29.....	-14	13	-2	Clear.
"	30.....	-16			
April	1.....	-15	32	16	Clear and bright.
"	2.....	-3	31	30	"
"	3.....	0	33	32	Overcast ; a flurry of snow at noon.

1899.	6 a.m.	Noon.	6 p.m.	Remarks.
	0	0	0	[spring day.
April 4.....	8	36	32	A few drifting clouds; S.W. winds; first
" 5.....	2	36	32	Bright in a.m. and cloudy p.m.; snow 6 p.m.
" 6.....	26	38	32	Cloudy a.m.; clear p.m.; S. wind.
" 7.....	24	38	35	Clear and bright; S. wind. [snow.
" 8.....	18	39	36	Cloudy; 9 a.m., snow; noon, rain; 6 p.m.,
" 9.....	22	32	30	A few flurries of snow during that day.
" 10.....	18	30	24	Snow a.m.; fine p.m.
" 11.....	-4	28	26	Clear and bright.
" 12.....	20	31	28	Heavy snow a.m.; clear and bright p.m.
" 13.....	-4	32	26	Clear and bright.
" 14.....	16	32	34	Light snow.
" 15.....	28	32	35	Snowing hard all day.
" 16.....	16	39	34	Clear and bright; hail storm 4 p.m.
" 17.....	14	34	34	" light snow.
" 18.....	28	34	32	Snowed hard a.m.; fine p.m.
" 19.....	24	39	33	Clear and bright till 5 p.m., then snow.
" 20.....	30	40	32	Snowing off and on all day.
" 21.....	15	39	34	Bright and clear; slight snowstorm.
" 22.....	12	43	38	" very warm.
" 23.....	10	46	42	"
" 24.....	21	54	52	"
" 25.....	25	48	40	Cloudy; S.W. wind; rain p.m.
" 26.....	22	38	34	North wind; snow p.m.
" 27.....	22	31	28	Cloudy; N. wind.
" 28.....	14	32	34	Cloudy; strong wind, with light snow.
" 29.....	18	26	22	Stormy; N. wind; snow at noon.
" 30.....	0	18	18	Cloudy; N. wind; very cold during night.
May 1.....	-4	26	22	Overcast; N. wind.
" 2.....	0	28	22	Clear a.m.; cloudy p.m.; cold.
" 3.....	29	40	40	Cloudy; light snow; S. wind.
" 4.....	32	42	40	Snow and rain a.m.; clear p.m.; S. wind.
" 5.....	32	39	36	Drifting clouds; snow a.m.; S. wind.
" 6.....	22	44	42	Clear and bright; spring day.
" 7.....	34	44	38	Cloudy a.m.; rain all p.m.
" 8.....	36	46	36	Rain a.m.; bright p.m.; strong S.W. wind
" 9.....	30	35	32	Clear and bright; strong winds. [p.m.
" 10.....	13	40	32	" a.m.; snow p.m.
" 11.....	24	36	31	" " "
" 12.....	24	34	34	" " "
" 13.....	20	39	40	" N. wind and cool.
" 14.....	24	49	39	Clear a.m.; cloudy p.m.
" 15.....	30	44	58	" " "
" 16.....	32	39	42	Snowed all day.
" 17.....	34	52	49	Clear and bright.
" 18.....	26	52	46	" shower p.m.
" 19.....	32	46	43	Bright a.m.; rain p.m.
" 20.....	36	47	44	Cloudy; heavy rain at noon.
" 21.....	40	50	50	Clear and bright to 6 p.m., then cloudy.
" 22.....	32	54	52	"
" 23.....	38	63	56	"
" 24.....	34	66	56	" S. wind.
" 25.....	38	52	40	Bright a.m.; showery p.m.
" 26.....	34	44	34	Cloudy a.m.; rain and snow all p.m.
" 27.....	38	40	38	Snowing; cold wind from S.E.
" 28.....	36	44	44	Clear a few hours a.m.; overcast p.m.
" 29.....	38	48	48	Drifting clouds.
" 30.....	32	54	54	Clear and bright.
" 31.....	32	54	54	Cloudy a.m.; rain p.m.
June 1.....	36	56	54	Cloudy.
" 2.....	36	50	42	Cloudy; rain noon; strong wind and rain 6
" 3.....	34	43	38	Snowing and strong wind. [p.m.
" 4.....	34	36	38	Snow and strong winds.
" 5.....	34	50	45	Overcast and N. wind.
" 6.....	42	56	52	Cloudy.
" 7.....	40	62	56	Clear all morning; overcast p.m.
" 8.....	48	46	48	Cloudy; light shower a.m.
" 9.....	36	45	46	Overcast; light showers p.m.
" 10.....	42	50	48	Overcast and showery all day.

1899.		6 a.m.	Noon.	6 p.m.	Remarks.
		0	0	0	
June	11.....	38	46	46	Rain nearly all day.
"	12.....	40	57	54	Clear in a.m. and showery p.m.
"	13.....	44	44	48	Heavy rain all a.m.; changeable p.m.
"	14.....	40	54	50	Clear, with few drifting clouds.
"	15.....	44	52	48	Clear and bright; heavy frost at night.
"	16.....	42	52	48	"
"	17.....	36	46	44	Cloudy nearly all day.
"	18.....	44	52	46	Clear; strong S. wind.
"	19.....	44	46	52	Clear a.m.; cloudy p.m.
"	20.....	42	60	56	Cloudy a.m.; clear p.m.
"	21.....	46	64	70	Clear and bright.
"	22.....	48	56	62	"
"	23.....	48	58	54	Light showers a.m.; clear p.m.
"	24.....	38	58	56	Clear and bright.
"	25.....	42	58	58	"
"	26.....	44	50	50	Rain all a.m.; showers p.m.
"	27.....	42	48	46	Cloudy all day; very cold.
"	28.....	41	44	42	Rain all a.m.; showery p.m.
"	29.....	42	50	46	Cloudy all day; strong N. wind.
"	30.....	42	50	50	Very changeable and a few light showers.
July	1.....	50	.....	54	Clear and bright; real summer day.
"	2.....	52	64	58	Clear up to 4 p.m.; then cloudy.
"	3.....	50	56	52	Clear up to 10.30.; thunder and lightning p.m.
"	4.....	42	59	54	Clear and bright.
"	5.....	45	50	49	Raining most of the day.
"	6.....	44	49	53	Raining all day.
"	7.....	42	52	62	Clear and bright.
"	8.....	48	64	61	"
"	9.....	46	51	50	Showery; thunder storm p.m.
"	10.....	42	48	46	Rainy and cloudy all day; cool.
"	11.....	40	58	59	Cloudy a.m.; clear p.m.
"	12.....	40	64	64	Clear and windy.
"	13.....	44	68	68	"
"	14.....	40	72	70	Clear.
"	15.....	42	79	72	Clear; cloudy and thunder p.m.
"	16.....	56	70	60	Cloudy; rain p.m., with thunder.
"	17.....	42	62	63	Clear a.m.; cloudy noon and clear p.m.
"	18.....	41	64	64	Clear and rain at 11 a.m.; cloudy p.m.
"	19.....	42	68	62	Cloudy.
"	20.....	46	58	56	Cloudy and rain.
"	21.....	56	65	58	Clear; rain p.m., with thunder.
"	22.....	47	53	56	Cloudy and rain.
"	23.....	46	56	57	Cloudy, cold with rain.
"	24.....	42	68	69	Heavy fog.
"	25.....	49	76	72	Clear.
"	26.....	48	73	66	Clear; cloudy and rain.
"	27.....	44	66	65	Clear.
"	28.....	41	73	72	"
"	29.....	44	80	68	Clear and heavy rain in p.m.
"	30.....	43	37	44	Cold rain; clear p.m.
"	31.....	30	60	60	Clear.
Aug.	1.....	41	70	68	Clear a.m. and p.m.; a fine day.
"	2.....	40	72	63	"
"	3.....	37	69	65	"
"	4.....	50	65	60	Cloudy a.m.; rainy p.m.
"	5.....	41	63	63	" and noon; rain p.m.
"	6.....	42	65	62	" and p.m.
"	7.....	33	65	58	Clear a.m. and p.m.; a fine day.
"	8.....	33	62	55	"
"	9.....	43	48	49	Rain all day; dull and cloudy p.m.
"	10.....	42	52	57	Rain a.m.; cloudy p.m.
"	11.....	42	56	57	Cloudy; rain 11:30 a.m.; cloudy p.m.
"	12.....	40	65	60	Clear a.m. and p.m.
"	13.....	46	56	55	Cloudy and rain a.m.; rain p.m.
"	14.....	44	62	60	Clear a.m. and p.m.
"	15.....	36	63	58	" rain p.m.
"	16.....	48	58	60	Heavy rain during night; rain a.m.
"	17.....	42	61	56	Clear a.m. and p.m.

1899.		6 a.m.	Noon.	6 p.m.	Remarks.
		o	o	o	
Aug.	18.....	33	50	48	Clear a.m.; rain and hail noon; rain p.m.
"	19.....	32	48	49	Cloudy a.m.; rain p.m.
"	20.....	40	50	50	" clear p.m.
"	21.....	26	56	57	Clear; heavy frost a.m.; clear p.m.
"	22.....	36	60	54	" cool a.m.; clear p.m.; fine day.
"	23.....	32	53	47	" cloudy noon; rain p.m.
"	24.....	38	50	42	Cloudy.
"	25.....	36	44	50	Rained all day.
"	26.....	34	52	48	Clear early; cloudy noon; rain, hail p.m.
"	27.....	38	56	52	Clear.
"	28.....	36	50	50	Cloudy a.m.; rained p.m.
"	29.....	30	55	59	Clear; a fine day.
"	30.....	40	49	53	Heav rain and thunder.
"	31.....	32	46	48	Cloudy; rain and cold; wind.
Sept.	1.....	25	42	46	Cloudy.
"	2.....	33	44	48	Rain.
"	3.....	34	44	46	Cloudy.
"	4.....	34	50	55	Cloudy a.m.; clear p.m.; change of moon.
"	5.....	24	56	58	Clear.
"	6.....	26	60	50	Clear and warm.
"	7.....	25	59	54	"
"	8.....	38	48	51	Cloudy and rain.
"	9.....	31	47	47	Cloudy and heavy rain.
"	10.....	40	50	52	Cloudy; rain.
"	11.....	36	50	44	Cloudy.
"	12.....	42	57	51	Cloudy a.m.; clear p.m.
"	13.....	27	54	58	Clear.
"	14.....	33	60	54	"
"	15.....	24	53	55	"
"	16.....	34	50	50	Cloudy a.m.; clear p.m.
"	17.....	27	58	56	Clear.
"	18.....	25	54	59	"
"	19.....	39	64	59	"
"	20.....	32	58	61	Cloudy; clear p.m.
"	21.....	38	53	50	Cloudy a.m.; rain and high wind p.m.
"	22.....	30	49	42	Clear a.m.; cloudy p.m.
"	23.....	35	45	52	Cloudy and rain.
"	24.....	46	70	61	Clear a.m.; cloudy and rain p.m.
"	25.....	38	60	55	Dull and cloudy.
"	26.....	39	53	52	Clear.
"	27.....	24	58	52	"
"	28.....	25	54	51	"
"	29.....	42	52	51	Cloudy and rain.
"	30.....	38	Heavy rain.

CASSIAR DISTRICT.

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ATLIN AND BENNETT LAKE MINING DIVISIONS.

REPORT BY J. D. GRAHAM, GOLD COMMISSIONER.

I have the honour to enclose my annual report of the mining operations in the Bennett and Atlin Lake Mining Divisions of Cassiar District for the twelve months ending 31st October, 1899. I also enclose report from Mr. R. C. Lowry, A. M. I. C. E., on the physical features of this country. Mr. Lowry was employed during the season defining the boundary line between this Province and the North-West Territories.

On the 1st December, 1898, I was appointed Gold Commissioner for the Atlin and Bennett Lake Mining Divisions of Cassiar District. Arriving at Bennett on the 29th of the same month, I assumed charge. I cannot say that I found the prospect encouraging. After examining the office records, I could see that I had a hard year's work cut out for me, and subsequent events proved that I was correct.

In the first place I found that hundreds of records which had been received by Norman Rant, and also by Mr. McKenna, who was acting as Recorder after Captain Rant had left for Victoria, were not posted up, for want of the proper record books, which were delayed *en route*. Further, Mr. McKenna was in need of more office help, which was not obtainable at Bennett at that time, though, after some delay, he had obtained the services of one clerk. I might also state that the structure used as an office building was not suitable for its purposes. During the winter months, in this northern climate, it was worse than a barn, and the uncomfortable condition of the same may be imagined when I say that the ink froze to the pen before it could be transferred to the paper. I immediately had the walls, ceiling and floor of one room cottoned and a large heater put in, making it as comfortable and warm as possible under the circumstances. As soon as possible, I obtained the services of two more clerks and commenced to post up all the back records and those coming in daily from Atlin. On the arrival of Norman Rant, who was acting as Mining Recorder during the year 1898, I had him go through all the applications for records which he had received before going out (about 1,700), and separate those for which he had received payment from those which were unpaid (nearly 800); those paid for were then recorded. The remainder were listed, and the matter referred to the Honourable the Minister of Mines.

A Special Commission was appointed at the last Session of the Legislature, to adjust the disputes existing in this District. I may state that considerable trouble was experienced at the commencement of this camp. The territory was claimed for the North-West Territories by the Mounted Police, and claims were located and recorded under their mining laws. Subsequently it was discovered that the territory was in British Columbia, and that claims would have to be located and recorded under the mining laws of this Province. This was henceforth done, and then the "jumping" process commenced, which might have been avoided to a considerable extent had a little firmness been adopted at the start. In the first instance, the

original 250-foot-claim owners were not compelled at once to take up their locations, but were allowed to select at leisure their 100 feet. (Under the laws of British Columbia placer claims are of only 100 feet, while under the laws of the North-West Territories they are of 250 feet.) This led to the re-staking of the 250-foot-claims by other men, with the off chance of securing the portion left by the original locator. Then again, creek claim owners were instructed to put in their stakes alongside the creek, and that they would then get their claims; but other parties came in later and staked right up to these stakes, with the result that many of the original claim owners did not get their full 100 feet. Again, many men came in and staked over ground which had already been staked, with the off chance of the claim not being recorded. This also led to endless trouble. The uncertainty also as to whether the Alien Bill, then before the House, would become law caused no end of staking by aliens, so that they could secure claims before the Bill became law. This is shown by the number of records applied for early in January, and the falling off immediately after the Bill was received here. In March, again, indiscriminate staking took place before the opening of the season, when fractions between claims were staked. This was more noticeable on Pine and Spruce Creeks, they being the creeks nearest to Atlin. Mr. Justice Irving did not arrive one day too soon to settle the disputes in this camp, and I must congratulate the miners for the good order and forbearance, shown by them in many instances under great provocation. Only three cases of threatening to shoot were brought before me as Magistrate, and considering that no immediate remedy was at hand to prevent "jumping," the camp has reason to be proud of its record. Only a single case of shooting took place, and that was done in a passion by a man who was slightly demented, on his being disturbed in his sleep.

Mr. Justice Irving, on his arrival, promptly got to work, and his decisions gave general satisfaction, considering the different interests at stake and the difficulty in getting at the truth. I cannot, however, help pointing out that he had hardly left the country before some unscrupulous persons immediately commenced to jump claims for omissions of the slightest technicalities; and this will continue until some remedy is provided to punish the guilty parties, or powers are conferred on the Gold Commissioner to settle the matters promptly.

ATLIN LAKE MINING DIVISION.

PINE CREEK.

Considerable work has been done on this creek during the season.

Placer Claims. Very few benches were worked, on account of the refusal of creek claim owners to allow the owners of bench claims to dump their tailings in the creek. Gold-bearing gravel was found in fairly paying quantities a little below the Discovery Claim, and also about one mile above the said claim. No great amount of work has been done, either above or below these points, although Pine Creek has been staked from Surprise Lake to its entry into Atlin Lake. Many of the creek claims were tied up until the Special Commissioner had decided as to the ownership, leaving little more than one month for actual work. After getting the ground into condition to work, high water came along and washed out a considerable number of the wing-dams, which necessitated the owners replacing their preliminary work, besides entailing considerable expense, which in many instances was not returned to them by their labour, but they still live in hope of recouping themselves next year. Many of the creek claims paid well; others did not pay the wages of the men employed. Benches which were worked paid fairly well within certain limits.

The *Caledonia Group* of bench claims, on the south side of Pine Creek, opposite Willow Creek, paid handsomely, this in a great measure being due to the way in which the ground was laid out for working by a practical miner. The largest wheel in the District was put in by this Company to elevate the water, together with flumes, etc., to convey it to their claims.

The following is a rough estimate of the amount of flumes, wing-dams, etc., constructed, and the number of wheels put in, by the various claim-holders on Pine Creek, in addition to which miles of ditches were excavated for conveying water to the sluice-boxes, besides drain ditches for the claims. The following data were collected by the Provincial Police and the Mining Recorder, from the owners of claims actually working on Pine Creek. The expense in opening up the ground was heavy, but this was unavoidable, by reason of the very small claims, which necessitated more head dams, tail dams, and ditches:—

Flumes put in	8,464 feet.
Wing, tail and head dams	7,802 "
Sluice-boxes	4,100 "
Drain ditches.....	2,580 "
Number of men employed	640
Number of water-wheels and pumps.....	38
Sluice-boxes	11,359 "
Expenditure incurred.....	\$95,872

WILLOW CREEK.

This creek is situated to the north of Pine Creek, and is supposed to be the old bed of Pine Creek, which supposition is borne out in a great measure, particularly on account of its richness. Little or no work was done on this creek until the Special Commissioner had adjusted the disputes relative to the claims. Nearly every creek claim was in litigation, pending the decision as to the ownership. The trouble began last year, when a Discovery was applied for, but refused by the Gold Commissioner. Subsequently, more creek claims were located; then, again, the question cropped up, are they creek or bench claims? Consequently, the ground was staked over as 100-foot claims (benches). Nothing was done during the winter months, but in March of this year new arrivals commenced to re-stake the ground, practically jumping the whole creek. Considerable friction existed between the various parties owning ground on the creek, and at times it appeared as though serious breaches of the peace would occur. This was happily averted and matters quieted down, until Mr. Justice Irving arrived and settled the ownership. After these points were decided, it was found that the water supply had given out, and to remedy this the miners formed themselves into a co-operative society and commenced to excavate a ditch about one and one-half miles long, bringing the water to their claims; but, unfortunately, the season was too far advanced, and many were not repaid for their outlay. In addition to the water ditch, the claim-owners constructed a drain ditch to be used for the purpose of draining the creek. Several shafts have been sunk on the benches through blue clay, with good results.

BIRCH CREEK.

This creek is situated on the north side of Pine Creek, into which it empties. Considerable work has been done by the creek-claim owners, but nothing very rich has been obtained, on account of the depth to bed-rock. Most of the creek claims have been taken up by an English syndicate, with the object in view of working them by hydraulic pressure, and for this purpose it has obtained a water record. A considerable portion of the benches has been taken up by hydraulic leases, and no doubt these will be in full blast next year.

BOULDER CREEK.

This creek empties into Surprise Lake on the north side. Considerable work has been done by the creek-claim owners, and some of the claims have paid fairly well; others did not pay expenses. The creek is full of large and small boulders, making it very expensive to work by the ordinary placer methods. During a portion of the season, two hydraulic plants have been in operation. One of these was installed by a Mr. Chase, who was put to considerable expense in getting water to his ground and putting in ditches and flumes. Neither of the plants were working sufficiently long to pay the initial expense, but no doubt next year better results will be obtained. Many hydraulic bench leases have been granted on this creek.

RUBY CREEK.

Little or no work was done on this creek and, practically speaking, all claims located were abandoned. Many applications for hydraulic leases on both bench and creek claims have been applied for on this creek, which empties into Surprise Lake on the north side.

WRIGHT CREEK.

This creek empties into the south side of Surprise Lake. Many claims on this creek were tied up and considerable litigation took place until the question of ownership was decided by the Special Commissioner. Considerable work has been done from No. 20 below Discovery to No. 30 above, with good results. Below Discovery the bed-rock is much deeper than above, and does not pay to work by ordinary placer methods. On one claim the owners sank a shaft 60 feet to bed-rock, and also rigged up an overshot wheel, to which was attached a Cornish pump to keep the shaft dry, and very good results were obtained. Good pay dirt has been found, and the largest nuggets in the District were here obtained. Only coarse gold has been found so far. Many hydraulic leases, both creek and bench, have been granted on the lower portion of the creek. Preliminary work has already been commenced to test the ground, with a view of ascertaining what appliances will be most suitable for working. This creek has paid much better, in proportion to the number of claims worked, than any in the District.

OTTER CREEK

Empties into the south side of Surprise Lake. No work, to speak of, has been done below the Upper Canyon, as the bed-rock is too deep. Above the Upper Canyon, fairly good pay dirt has been obtained and plenty of work done. Several leases, both bench and creek, have been granted on this creek.

SNAKE CREEK

Empties into Pine Creek on the south side. It was abandoned, and has since been taken up for hydraulic purposes. The gold from this creek is very fine, and cannot be saved by the ordinary methods of working.

STEPHENDIKE CREEK.

On this creek little or no work has been done this season; only four applications have been put in for hydraulic leases. Insufficiency of water to work the claims is the reason, and this can only be obtained from Pine Creek at considerable expense. Litigation tied up the creek until the Special Commissioner adjusted the disputes.

SPRUCE CREEK AND ITS TRIBUTARIES.

This creek has had more work done on it than any other, and with very poor results to the worker. Bed-rock was found to be very deep, with but few exceptions. The small size of the claims did not enable the owners to get the necessary drainage without the expense of



COL. CREIGHTON'S HYDRAULIC—SPRUCE AND DOMINION CREEKS, ATLIN.



NUGGET POINT, PINE CREEK, ATLIN.

(PHOTO, KINDNESS OF MUIRHEAD BROS., ATLIN.)



water-wheels, pumps, etc. When permission was granted to construct drainage ditches, and after considerable expense had been incurred, the parties below would often turn the creek to the opposite side to work out another portion of the bed, rendering the work useless. Further, the men did not seem desirous of helping one another. Most of the work below Discovery was dead work, and done with a view of opening up the ground, and, as stated before, with very poor results. Of course there were some exceptions. The general opinion expressed is that most of Spruce Creek will have to be worked by drifting or ground sluicing. The present system of working 100-foot claims is not a success, and is too expensive. Most of the preparatory work is costly, and leaves little or no room for the tailings when sluicing. Bench claims on this creek will mostly all have to be drifted, on account of the enormous bodies of sand and gravel above the pay dirt, or worked by hydraulic methods, and this cannot be undertaken without an enormous expense in getting rid of the tailings and getting water to the ground. Many leases have been granted on this creek and its tributaries.

LITTLE SPRUCE CREEK.

Considerable work has been done by the creek claim owners on this creek, with fairly good results. Water, however, failed, and necessitated the closing down of some of the claims. Some of the benches were worked and paid fairly well, but they also had to close down for want of water.

MCKEE CREEK.

This creek empties into the east side of Atlin Lake. Most of the work done this year was on the creek claims. *Discovery* claim paid well, and a large group, managed by Captain Wallace Langley, has been opened up with a view to working on a larger scale next year. Hydraulic leases have been applied for on this creek.

O'DONNELL RIVER.

This empties into Atlin Lake on the east side, and extends into the mountains a considerable distance. Little or no work has been done on the main stream; a little work was done on its tributaries.

Fresh discoveries of gold in paying quantities were made this Fall on Wolf, Fox, and Kid Creeks, tributaries running into Carvell Creek, which empties into Dixie Creek, and which in turn empties into Cariboo and thence into the O'Donnell River. Leases have been granted on Feather, Carvell, and Wilson Creeks, tributaries of the O'Donnell River.

MOOSE AND MELVIN CREEKS.

These creeks empty into Atlin Lake on the south side. No work has been done by claim owners, and it has since been taken up for hydraulic leases.

TROND GULCH

Empties into Fourth of July Creek. Many placer claims were located on this creek during last fall, but no active work was undertaken this summer and the creek was practically abandoned, but has since been taken up for hydraulic purposes, and, from indications, should pay handsomely in fine gold if the proper appliances are put in. I am led to state this by Mr. Bateman, mining engineer, who has tested the ground, and who informed me that it will be very expensive to bring water for hydraulicizing, practically making it prohibitory for ordinary placer mining.

This year's work in the Atlin District has been more of a preliminary nature, but with the initiation of hydraulic plants better results may be looked for. A noticeable feature here is the absence of old practical miners to work the ground.

Litigation in the early part of the season retarded the progress of the camp, and, as before stated, high water did considerable damage. In working the larger areas of gravel, greater care will be taken of the water, and a system of storage adopted in order to conserve the same. During the present season no steps were taken to do this by any of the various claim owners. There is also a tendency on the part of many to acquire the adjoining claims, with a view to working them more economically next season. From present indications, next year will be a prosperous season in the working of placer claims in the District, many of the dissatisfied persons having left the country, and there is therefore an opening for fresh parties.

During this season there has been considerable activity in the location **Mineral Claims.** of mineral claims in this section, but little or no development work has been done to demonstrate their commercial value. Most of the locations are gold propositions, and fairly well distributed throughout the Division. Many locations have been made on the east side of Taku Lake, and from reports received will justify considerable development work next season.

The Anaconda Mining Company, of which Lord Hamilton is the moving spirit, has purchased twenty claims within a quarter of a mile of the Townsite of Atlin. Since these properties were acquired, active development work has been in progress to open them up. Mr. Fetherstonhaugh represents the Company, and it is his intention to prosecute development work all this winter.

Other claims, all within a short distance of Atlin, have been bonded by various parties, and no doubt next year will see considerable activity in the development of mineral properties in this Division. A considerable number of locations have been made in the vicinity of the Townsite of Atlin, and, in fact, it is surrounded by quartz locations. Some very good copper locations have been made down the lake, and one property carries native copper. Little or no development work has been done on copper properties. On Pine Creek, many of the quartz locations carry good gold values, and a few of the claim-owners intend to open up their properties this winter.

OFFICE STATISTICS—ATLIN DIVISION.

(For year ending October 31st, 1899.)

Records, 8,092, representing	8,619 claims.
Bills of sale, etc., recorded	1,917
Gold Commissioner's permissions recorded	216
Abandonments recorded	57
Grouping of claims recorded	176
Certificates of leave of absence granted, representing leave of absence to	4,762 claims.
Orders issued by the Gold Commissioner under Part IX. of the Placer Mining Act	175
Papers filed	70
Hydraulic leases granted	165
Hydraulic leases applied for (not yet granted)	122
Water records issued	26
Water records applied for (not yet granted)	71
<i>Mineral Claims.</i>	
Records of mineral claims	645
Certificates of work	32
Bills of sale, etc., recorded	77
Gold Commissioner's permissions recorded	7

Gold Tax.

Abstract from returns by creeks, showing the number of ounces of gold on which royalty has been paid this year:—

Pine Creek	13,828.21 ounces.
Spruce Creek	2,270.23 "
Stray Gulch	1.00 "
Dixie Creek	120.00 "
McKee Creek	2,729.00 "
Willow Creek	1,002.33 "
Boulder Creek	2,440.00 "
Wright Creek	3,749.00 "
Birch Creek	143.75 "
Otter Creek	274.50 "
Various	21.50 "
Total on which royalty was collected	26,579.52 "
Amount of royalty paid	\$ 4,043 67

Revenue Collected.

Atlin:—

Free miners' certificates	\$18,940 25
Mining receipts	43,823 40
	<hr/>
	\$62,763 65

Estimated value of gold per oz., \$16. Total yield, \$800,000.

BENNETT LAKE MINING DIVISION.

On the Dalton Trail last Fall, some good indications of copper float were found, and a few mineral claims staked. This year has seen much greater development work, and a good deal of steady work has been done, with results satisfactory to the parties concerned. There were 230 locations made, and assessment work was done on 20 claims in this Division to date. New discoveries were made at the head-waters of Boulder Creek, within a few miles of the Police Camp, of galena, the assay values of which are from \$100 to \$170.

The route into the mining district on the Dalton Trail is by way of Haines' Mission, thence to Pyramid Harbour by boat; leaving Pyramid Harbour on horseback early, it is possible to reach Porcupine Creek in one day and Rainy Hollow the next. Mr. Dalton has constructed a road, and has good resting places for both man and beast at reasonable rates.

A good waggon road has been constructed nearly all the way to the Police Camp, with the exception of about 10 miles; it follows the Chilkat bottom, and is impassable during the summer months, when pack-trains must be used, and during the frosty weather and winter months the river is followed, which enables heavy loads to be transported to the interior.

On Taku Arm (west bank) and on Bennett Lake many mineral claims have been located this Fall which show up very well, and are likely to prove valuable in the near future. Assessment work has been done on six of these to date, and no doubt further development work will be done this year.

On Otter Lake there have been also several mineral claims located recently, but no certificates of work have been applied for as yet.

Many placer claims have been located on Gold Run Creek, a small Placer Claims. stream which flows into the Holly River about half a mile above its junction with the Big Horn or Otter River, and being about 12 miles in a south-westerly direction from Otter Lake. These claims were found to be too deep to be profitably worked by the ordinary placer methods, but this section will no doubt be heard from in the near future.

On the whole, the mining industry in this Division has made great strides this year, and next year we may reasonably hope to find this a flourishing mining centre.

OFFICE STATISTICS—BENNETT LAKE DIVISION.

(For year ending October 31st, 1899.)

Mineral.

Records of mineral claims	230
Certificates of work	20
Bills of sale, etc., recorded	44

Placer.

Placer claims recorded	67
Leaves of absence granted	3
Bills of sale, etc., recorded	1

Revenue Collected..

Free miners' certificates	\$2,247 75
Mining receipts	982 60

Whilst the development does not approach that of the Atlin Division, still the results are so far satisfactory, the Division extending over a vast area and future prospects being very bright. Considering the amount of work done and the number of mining receipts issued at Atlin, this appears to show very favourably for the Bennett Lake Mining Division.

REPORT UPON THE ATLIN AND BENNETT LAKE MINING DIVISIONS.

By R. C. LOWRY, M. E., A. M. I. C. E.

The Atlin Mining District extends from the Dalton Trail (west of the Chilkat River) easterly through about four degrees of longitude, or a length of about 140 miles, to the watershed between Surprise and Gladys Lakes. The north boundary is the recently demarcated sixtieth parallel of north latitude. The southern limit is the line between the United States and Canada. Within this extensive range of country there is, in the aggregate, a large area of lakes whose waters drain indirectly into the Yukon River. The principal lakes of the District are Atlin, Taku Arm, and Bennett. These are long, narrow stretches of water, lying over 2,000 feet above the sea level, and in a direction roughly north and south, being parallel to each other. Continuity of navigation between Bennett and Atlin City is broken between Taku Arm and Atlin Lake by a neck of land less than two miles wide, through which the Atlin River, the principal outlet of Atlin Lake, cuts its way. This stream has a fall of

over 47 feet in its length of three miles. Its course is tortuous, and the fall or grade of its bed is irregular. As a result of these conditions, the stream in its present state may be declared commercially impracticable as a highway; no loaded steamer has as yet attempted to navigate it. The Atlin River could undoubtedly be made navigable by canalising, but whether the cost of so doing would be commensurate with traffic requirements remains to be seen. At present freight is carried over the portage on a tramway about one mile and three-quarters in length. This will probably be converted into an electric railway in the coming year, the power for working the line being generated by the waters of the Atlin River.

Of the Atlin District prior to June, 1898, apparently nothing was known beyond the fact that a few big lakes, of which the largest was called Atlin, lay in that part of Cassiar, amidst rugged hills and massive glaciers. Early in the year 1898 two prospectors—Fritz Miller, a German, and Kenneth Maclaren, a Canadian—left the Klondike Trail at Bennett and, travelling on the ice, crossed Taku Arm and Atlin Lake, to find gold in Pine Creek. This stream they followed up, prospecting as they went, and finally decided to stake their “claim” about six miles from the mouth of the creek, where Pine City is now established. Dearth of supplies sent our argonauts away to Juneau; from here, on their return, they were followed up; and their cherished discovery was soon announced to the world.

To the natural beauties of this Atlin country it would be impossible for even the most apt pen to do justice. A combination of every feature that renders the most lovely landscape attractive, with a variety and scope of colouring unique in itself, is seen on any side in the ever-changing lights of our glorious summer days. And from September, when the first tints of Autumn gild the poplars and the birches, until

“the shadow of the winter’s on the year,”

the rapid transformations, the kaleidoscopic changes, make us marvel, while we revel in the glories of fair Atlin.

Of the fauna and flora of the District much, of course, remains to be learnt. Though the country can hardly be described as a “sportsman’s paradise,” there is, nevertheless, no lack of game, large and small. Moose, caribou, big horn, mountain sheep and bear—grizzly, cinnamon and black—are commonly seen; while ptarmigan, grouse, duck of all kinds, and rabbits are in parts plentiful. The streams and lakes hold trout of large size, and grayling and whitefish can be had at all seasons.

The profusion of wild flowers to be seen on every hand adds to the pleasure of a summer sojourn on this high Arctic slope. The growth of timber is, when compared with that of lower British Columbia, of small size; few trees are to be seen of more than two feet diameter at the base. The principal trees are jack-pine and spruce, and considerable inroads have been made on forests of these trees, within a radius of ten miles of the town of Atlin, to supply the three small lumber mills that are established here.

The geological formation of the District is already under examination by the distinguished Department of the Dominion Government in charge of such scientific work. The rock formation is very interesting, there being many well-marked contacts. East of Atlin Lake, as far as Surprise Lake, the formation appears to be diorite; beyond this gneiss predominates. At the south end of the lake sandstone of uncertain age prevails, and basalt is to be seen here as well as in other parts of the District. South-west of Atlin City, on Goat Island, there is a large mountain of syenite. Outcrops of limestone have been found. Cutting through the diorite—in the bed of Pine Creek, for instance—veins of quartzite, as many as six feet wide, showing free gold, have been uncovered, and there are—*e. g.*, in the vicinity of Atlin City—extensive blow-outs of the same class of rock which assay well. The thorough exploitation which the last-mentioned ore bodies are now undergoing at the hands of Lord Ernest W.

Hamilton's Company will demonstrate their worth; and if the apparently well justified expectations of this Company are realized, the future of the Atlin Camp is assured. Put briefly, the indications so far appear to be that there are large bodies of low grade ore susceptible of easy manipulation, and which are largely free-milling, or amenable to a cheap process for extraction of the gold.

The whole country has been under glacial action in relatively recent times. Indeed, a considerable proportion of it is even now covered by glaciers, of which the principal one is known as "Norna" or "Llewellyn," and lies in a line, approximately north-west and south-east, to the south of Atlin Lake and Taku Arm, extending over a length of forty miles.

Whether the immense gravel benches that rise on each side of the principal creeks are due to glacial action entirely, or to combined glacial and fluvial influences, is not probably a question of much interest. A point of material interest, however, is the fact that these immense bodies of gravel are gold-bearing, and that, beyond question, they are in parts very rich. The topography and the hydrographic features of the country at once mark the District as being one eminently suited for hydraulic mining on a very large scale. The valleys are generally narrow and deep; the fall of the streams is from 40 to 400 feet to the mile; ample water is available during the working season, and economical sites for conserving dams are to be found on most of the feeders; the lakes afford a practically unlimited dumping capacity; and, finally, there are no agricultural interests to be protected.

In the past summer, a great deal of work—much of it unintelligently approached—has been done by individual miners on 100-foot claims, working the creek beds. Some of these men have made money at the work, but it is doubtful if the larger proportion of them made wages. In this Atlin country at least, it is a fact that the 100-foot placer claim has proved to be a delusion and a snare. Argument in support of the above statement would be too lengthy to embody in what purports to be a mere sketch of prevailing conditions, but corroboration of the fact will be forthcoming on all sides.

These same creek beds cannot, for the most part, be worked by the 100-foot claim holder, owing to the great depth of gravel on the bed-rock. To deal with the conditions economically, hydraulic methods—including in places the use of elevators—will have to be resorted to. Intelligent mining in this way will be richly rewarded.

ATLIN MINING DIVISION.

NOTES BY J. C. GUILLIM, B. A. SC., OF GEOLOGICAL SURVEY.

(The following notes concerning the Atlin District are by Mr. J. C. Guillim, who was engaged during the past summer in work for the Geological Survey of Canada in the District. The notes have been communicated by the kind permission of the Director of the Survey.)

The Atlin Mining Division lies at the extreme northern limits of British Columbia, and just east of the Pacific Coast Ranges. It was formed into a Division after the discovery of placer gold in the summer of 1898, and has since been an active gold producer, but of moderate production compared with some richer northern gold fields.

The chief route to Atlin is by way of Skagway and Bennett, continuing along the way to Dawson until Tagish Lake is reached. From here Taku Arm is followed southwards by steamer for about 65 miles to Taku Portage. Thence by another steamer four miles across

Atlin Lake the town of Atlin, on the eastern shore, is reached. With fair connections the trip from Skagway to Atlin may be made in less than twenty-four hours, by railway and lake steamer, during the summer.

The general appearance of the District somewhat resembles Kootenay, by its north and south lake system, but the mountain ranges are less rugged, appearing as low rounded groups with wide valleys or low slopes between them.

The greater portion is readily accessible either by boat or pack animal. Bunch grass is abundant along the upper valleys.

The geological conditions of the District appear favourable to the production of ore bodies, the chief rocks being sandstones, quartzites and magnesian rocks. Areas of granite occur throughout, and other intrusions of a more basic character are common about the more apparently mineralized localities.

Pine Creek, with its tributaries, Spruce, Boulder, Wright, Birch and Otter Creeks, together with McKee Creek, are at present the productive gold-bearing creeks. They lie in rocks, which appear to be a distinct series. Rocks of a slaty or schistose character are not common, excepting about Wright, Otter and the upper part of Spruce Creeks. The prevailing rocks are of a rather massive fine-grained appearance, often similar to greenstone.

Practically no new productive ground was discovered during the past summer. Though many creeks are staked out, they appear to have been hurriedly prospected, and are now unrepresented. Of the many people who reached the place last spring comparatively few experienced prospectors seem to have remained, and the industry was confined to claims already staked.

About 1,500 men were probably employed in actual productive work during last season. It was commonly stated that from one-half to two ounces of gold per man per day was taken out. The average, however, for all the time spent, together with costs of outfitting, in many cases leaves but a small net return from the 100-foot claims, especially where the bed-rock is deep and covered with boulders, as it commonly is.

Only those portions of the creeks were being worked where bed-rock was comparatively shallow, costs of operating being excessive, for value contained, in the case of single 100-foot claims. Much of the intervening ground is being leased to hydraulic companies, and also some of the benches said to contain values sufficient for cheaper operation.

It is probable that the District will come into the hands of companies operating on groups of claims, since the individual miners, in many cases, have washed the richest streaks of their small claims and have sold out for a few hundred dollars or less. The continued reports of discoveries at Cape Nome were also attracting many away.

Up to the present time not much work has been done on quartz claims. There are discoveries of well-defined fissure veins in the hills east of Atlin. They usually carry the common sulphides of iron and lead, together with a small amount of copper. The vein filling is usually quartz, sometimes showing native gold and crystals of argentite. These veins are often strong and well mineralized with the base sulphides.

In several places to the south of Atlin Lake discoveries of native copper have been located. Not much has been done so far to prove their extent and value, but their presence is promising. The mineral is found along seams and disseminated in a "serpentinized" rock.

Another mineralized district lies south and south-west of Golden Gate, on Taku Arm, the chief minerals being galena, iron and copper pyrites, grey copper and native gold, usually in veins of quartz.

The chief development is now being carried on at the Anaconda Company's claims, close to Atlin City, under charge of Mr. R. D. Fetherstonhaugh. Here a wide belt of rock, composed largely of magnesium carbonate, is impregnated with pyritic matter, and seams of quartz and calcite.

Wide sampling of this material, made to prove how the values are held below the surface action, gave gold values sufficient to encourage the present development.

The District is not especially "a poor man's country," yet there is a fair field for prospecting both quartz and placer, more especially of interest to those who can wait or have capital to develop with.

Costs of mine material, labour and food are necessarily higher than in southern British Columbia. During last season wages were about \$5 a day.

The placer gold is not economically won by the individual miner, except in a minority of cases.

The quartz showings will need capital, if they prove workable under present conditions, since the smelting ores are not exceptionally rich, nor is free-milling ore apparently abundant.

The climate is moderate, a medium between Kootenay and Klondike, and exceptionally dry.

The open summer season extends from about June 1st to September 20th. Not much is done in winter, although there appears to be a good field for shaft sinking and tunnelling along the courses of the creeks in order to find earlier deposits of pay gravel.

NORTHERN PORTION OF CASSIAR DISTRICT.

REPORT OF JAS. PORTER, GOLD COMMISSIONER.

I have the honour to transmit herewith my annual report on the progress of gold mining in this District. I have not been able to prepare mining statistics giving the yield of gold for the season, owing chiefly to the scattered condition of the mining localities. I do not think, though, that the output has been anything in advance of the past year or two. Of course, what is wanted here is easy transportation and capital to begin with, and when these are obtained I will venture to say that the mineral resources of the District will do their share in proving that this vast tract of the Province is not barren and valueless.

During the season, some prospecting for quartz has been done in directions not hitherto traversed by the prospector, and the result has been that several locations have been made and some very good-looking rock has been taken out for assay. It is said that a few rich copper veins have been discovered, and prospectors in general seem confident that the time is near at hand when the District will spring into mining activity.

The Cassiar Central Railway Company has had men in the field prospecting during the summer, and they seem to be very well satisfied with their season's work. A few days ago, I had the pleasure of a chat with Mr. Alexander Hamfield, manager in the field here for the Cassiar Central Railway, who had just returned from an extensive trip into the interior of the District. He had been as far as Liard Post, on the Liard River, and had also visited several other interior points during the season. Mr. Hamfield informed me that, although he could not report any big finds having been discovered by his people during the summer, he was well pleased with the season's work, as favourable indications were apparent.



LOG CABIN, BENNETT MINING DIVISION.



"DISCOVERY," PINE CREEK, ATLIN MINING DIVISION.



Quite a number of hydraulic, creek, and dredging leases have been applied for and granted during the season in various parts of the District. The ground covered by the leases on Thibert Creek acquired last spring by Messrs. Martin, Langley, Griffiths, and McGregor, on behalf of the Cassiar Central Railway Company, has prospected beyond the expectation of the owners.

I think, beyond a doubt, that next year will see a permanent revival of mining activity in the District.

If it is not out of place, I would like to mention here that I think it would be a good thing for all parties concerned if the Cassiar Central Railway Company, when making choice of blocks of land of four miles square, was obliged to send to the Gold Commissioner's Office of the District, within a specified period of time, a plan with full description of said block or blocks, as the case may be, and a clear and exact description should be given of the "designation post," so that it could be posted up in the office for reference. Prospectors and others are complaining a great deal of not being able to know just when and where the Company makes its selections. I cannot see that this could possibly have any injurious effect on the Company, and it would give great satisfaction generally.

NOTE BY J. F. HUME, MINISTER OF MINES.—I am of the opinion that Mr. Porter's suggestions should be carried out, as I have already had several complaints of the same kind. It may be necessary to amend the Act.

SKEENA MINING DIVISION.

(A Division of Cassiar District under the jurisdiction of the Victoria Gold Commissioner.)

REPORT BY JNO. FLEWIN, MINING RECORDER.

SIR,—I have the honour to report as follows on mining operations in the Skeena Mining Division during the year 1899 :—

From various causes, not necessary to enumerate here, mining operations in this section during the past year have not been as vigorously prosecuted as had been anticipated by many. Several properties, though, have had sufficient work done on them to show that there will very likely be, in the near future, a number of good mines, principally copper-gold propositions, working on a paying basis. The greatest drawback continues to be the primitive and costly means of communication.

Indications point to the Kitamaat-Kitsilas section as likely to be the principal centre for the mining industry for some time to come, although great difficulties will be here experienced, both in the getting in of supplies and shipment of ores, until either a good waggon road or a railroad is built from Kitamaat Arm to the Skeena River.

KITSILAS CAMP.

Owned by a syndicate of eastern capitalists. On this claim work to Ptarmigan Mineral the extent of upwards of \$2,500 has been done. The ledge has been Claim. stripped for 600 feet, six open cuts of various lengths have been run, and an inclined shaft fifty feet deep has been sunk. This shaft bottoms in four feet of good ore, carrying a very high assay value.

Same owners as preceding. Fifteen hundred dollars have been Ormonde Group. expended on this group. The ledge has been stripped for 300 feet, a tunnel has been run 25 feet, and three open cuts made on the property. This Company has expended \$7,000 in the camp during this season, and intends to prosecute work vigorously in the Spring.

Toulon, *Bull Dog* and *Montezuma* mineral claims, owned by Messrs. Kendall and Schwarz, the original locators of the *Emma* mine. These claims were only located in May, but the owners have worked continuously at development work and are showing up a fine body of bornite, carrying high values in gold and silver. On the *Toulon* an open cut has been run, 35 feet deep and 25 feet wide, from which a large quantity of good ore has been piled out on the dump.

Four Aces, *Golconda*, *McKinley* and *Laurier* mineral claims, owned by the Hickey Syndicate. These claims are situated on the extension of the ledge on which the *Emma*, *I. X. L.* and *Bootjack* are located, on Kitsilas Mountain, and are considered to be some of the best locations in the camp. Several open cuts have been run on them and other prospecting work done, but outside of the assessment work required by law, no extensive development has taken place. One reason of this is, I understand, that an American company was negotiating for their purchase, but has not, as yet, succeeded in coming to terms with the owners.

Besides these claims, 27 other locations have been recorded in this camp since May last, and prospects of active work on a number of claims are bright for 1900.

KITAMAAT ARM.

The principal discoveries made in this region are at or near the head of Kitamaat Arm. These consist of the *Copper Queen*, *Mighty Dollar*, *Kitamaat Gem*, and *Golden Crown*, located and owned by two prospectors from Boundary District, Messrs. Steele and Dunn. This year's assessment work shows up a fine body of copper sulphides 16 feet in width, similar to the ore found on Princess Royal Island, off the mouth of the Arm, and assaying \$20 in gold. The owners have thoroughly prospected these locations, and intend to further prosecute work with the opening of Spring.

Donahue Group of five claims, consisting of the *Margaret*, *Orphan*, *Donahue Group*. *H.F.*, *Mountain Goat*, and *Excelsior*, is situated on Observatory Inlet. This is a low grade proposition, showing surface assays of from \$4 to \$12 per ton. The ore bodies are very large, and lie within a few hundred feet of salt water. The ore is a pyrrhotite, carrying gold and silver. The owners have been engaged in stripping and prospecting the property this season, and cutting trails to the claims.

Ten miles from this group, the same owners have located this Fall the *North Star* and *Emma* mineral claims. The ledges are very wide, in a diorite formation, assays giving on the surface \$2.40 in gold, 2 oz. silver, and 22 oz. of molybdenum per ton.

BITTER CREEK.

The *Grizzly*, *Owosso*, *Birmingham*, and *Stella* mineral claims are located on Bitter Creek, a tributary of the Bear River, which empties into the head of Portland Inlet on the South-eastern side. These claims were located by H. B. Connor and partners last May. The ore is a copper sulphide, carrying gold. Extensive development work has since been done, one partner going out in June, procuring horses for packing and twelve months' supplies, and returning to the claims in July. Two partners are wintering there, while one has gone East to procure the necessary capital and machinery to work the claims, which lie about 12 miles from the head of the Inlet.

Last month a prospecting party from Port Simpson located a fine-looking galena ledge on Dundas Island, 15 miles from that place. The ledge is said to be 32 feet wide, but I have not yet heard the result of the assays. A few days later, another strike was made on Elizabeth Island by some prospectors who had previously located a bornite ledge on Gribbel Island.

LORNE CREEK.

Only one claim, the *Dry Hill* placer claim, has been worked this year, with better results than for some years past, the clean-up having exceeded \$3,000 for a six weeks' run.

It was hoped that active operations would have commenced this year on the hydraulic leases of Messrs. Henderson and Lyne, but, as yet, nothing has been done on them.

On one of the tributaries of the Telkwa River the Forrest Company has located the *Discovery*, *Daisy*, *Telkwa*, *Naiad*, *Oread*, *White Heather*, *Julia Arthur*, *Indian Chief*, and *Tenderfoot* mineral claims. The proposition is a copper-gold one, and the body of ore is very large. Some members of the Company intend working all the winter on development work.

On the whole, the outlook for the coming year is very satisfactory, the work already done on the different locations proving the mineral area to be a large one; in fact, ledges carrying more or less of the precious metals in combination with the baser are met with all the way from the Alaska boundary line to the southern boundary of the District, and inland as far as prospectors have yet reached.

The following are the office statistics, which show a decided improvement over last year:—

OFFICE STATISTICS—SKEENA MINING DIVISION.

	1898	1899
Number of free miners' certificates issued	92	96
" " mining claims recorded	31	132
Certificates of work	9	12
Conveyances	22	14
Revenue from free miners' certificates	\$460 00	\$460 75
" " other mining sources	155 00	437 50
Total	\$615 00	\$898 25

SOUTH-EAST KOOTENAY DISTRICT.

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FORT STEELE MINING DIVISION.

REPORT BY J. F. ARMSTRONG, GOLD COMMISSIONER.

I would report as follows on the progress made in mining during the year ending 31st December, 1899:—

This Division comprises the drainage area of the Upper Kootenay River and its tributaries south of Finlay Creek, being bounded on the east by the Territory of Alberta, and on the south by the United States boundary line. It is about 80 miles in length and 80 miles in width, and has a total area of between 6,000 and 7,000 square miles. By subdividing the territory into six sections, three being on either side of the Kootenay River, the situation of mineral claims will be clearly shown as follows:—

Sections.	Held under Crown grant.	Certificates of Work.	New Locations.	Total.
North-East			10	10
East Centre	10	207	192	409
South-East	4	34	57	95
South-West	8	122	113	243
West Centre	46	341	316	703
North-West		14	41	55
	68	718	729	1,515

NORTH-EAST SECTION.

The only claims in force in this section are a few at the head-waters of Sheep Creek. These are situate close to the claims in the East Central Section, and are reached by a trail running along the North Fork of Wild Horse Creek. Specimens from these claims show high values in silver, and it is expected that the extension of the North Fork Trail, as proposed, will permit of further prospecting in this section.

The country about the lower part of Sheep Creek is very difficult of access, the creek running through a deep canyon for many miles. The country around White River, in the extreme north-east part of the District, has not been prospected at all, and its mining value is unknown.

EAST CENTRAL SECTION.

The East Central Section includes the drainage area of Wasa, Tracy, Lewis, Wild Horse, several smaller creeks, and Bull River, and contains 26 of the mining properties in the Division. On Wasa and Wolf Creeks there have been 12 certificates of work and 10 new locations. Assessment work has been done on these properties, which are situate at a short distance from the waggon road and from the Kootenay River, affording cheap transportation for the ore.

On Lewis Creek and Diorite Basin there have been 25 certificates of work and 19 new locations. Further development work has proved that there are good values in this locality. Two hundred and seventy feet of tunnelling and drifts has been done on the *Tiger* and *Minnie M.*; 100 feet of shaft work has been done on the *John L.*; 120 feet of shaft work on the *Montana*, and 180 feet of tunnelling on the *Golden Fleece Group*. These claims show galena and copper.

On Tracy Creek and Grundy Basin there have been 27 certificates of work and 11 new locations. Descriptions of the *Estella Group* were given in last year's Report. The principal claims are but a short distance from Tracy, within reach of river transportation, there being a waggon road from Tracy to the Kootenay River.

I have been furnished with the following description of the development work on the *Estella Group*:—"On the vein carrying tetrahedrite, one tunnel 100 feet, another 80 feet, and "an open cut 12 feet; a tunnel 712 feet through country rock, which, although run in to "cross-cut the grey copper lead, will be of great assistance in the prospecting of the galena "ledge, of which it is within 250 feet. On the galena ledge there is a tunnel in 200 feet, and "a shaft 75 feet. It is a promising property, and ore will probably be shipped from it during "the coming summer."

On Six-Mile Creek and Four-Mile Creek together there have been 19 certificates of work and 8 new locations. The work on these creeks is merely the ordinary assessment work.

Wild Horse Creek. In the Annual Report for 1898 a description will be found of the placer mining which has been carried on on this creek during the last 35 years. During this past year but little has been done in this line.

The mineral claims on this creek include one held under Crown grant, 71 certificates of work and 96 new locations. On the *Dardanelles Group* 200 feet of tunnelling has been done. Extensive work has been done on the *Big Chief* and *Dupont Groups*. The former has about 300 feet of tunnelling and cross-cuts, and the latter group about 150 feet of tunnelling and cross-cuts. On the *Dougherty* mineral claim there is an inclined shaft of about 120 feet.

There is a waggon road from Fort Steele to Victoria Gulch, on Wild Horse Creek, and good trails from there to the Forks, as well as up the East Fork and up Boulder Creek. It is proposed to extend the trail up the North Fork. All the properties on this creek can now be reached by trails. Waggon roads could be built in many parts at a comparatively low cost.

On the small creeks between Wild Horse Creek and Bull River there are 5 Crown-granted claims, 13 certificates of work, and 16 new locations. On none of these claims has there been any extensive development work.

On Bull River there are 4 Crown-granted claims, 40 certificates of work, and 32 new locations. Work on the *Chickamon Stone Group* includes 360 feet of tunnel, 136 feet of shaft work, and 80 feet of winze. The ore carries copper, silver and gold. Valuable discoveries have lately been made on the *Old Abe*.

In the Annual Report for 1898 will be found descriptions by the Provincial Mineralogist of properties on this river. The work which has been done this year has proved the value of several of the propositions, and extensive development work is expected during the next summer. The chief claims are within a quarter of a mile of the waggon road, within five miles of the Kootenay River, and within twelve miles of the Crow's Nest Railway.

SOUTH-EAST SECTION.

On Sand and Rock Creeks there is one claim held under Crown grant, 23 certificates of work, and 75 new locations. Two hundred feet of tunnelling has been constructed on the

Blue Grouse mineral claim, and extensive development work is now in progress on the *Empire* mineral claim, about 12 men being steadily employed. Much work has also been done on the *Mountain Group*, but I have not been furnished with any figures. These claims are within three miles of the Crow's Nest Railway, and waggon roads are constructed to within a very short distance of the claims.

South of Sand Creek and Rock Creek there are 3 Crown granted claims, 11 certificates of work, and 22 new locations. Development work has been prosecuted on several of these on a small scale. On the *McIntosh Group* development work has been more extensive.

The Crow's Nest Pass coal fields are situate in this section. Coal is now being shipped from Fernie, Sparwood and Michel Stations. The output is increasing daily, amounting at times to 1,000 tons a day.

(NOTE BY PROVINCIAL MINERALOGIST.—For description of the Collieries, See under head of Coal Mining in the Province.)

SOUTH-WESTERN SECTION

Includes the drainage area of Moyie River, Yahk River, and Gold Creek. The claims in this section are situate around Moyie Lake, and Palmer, Nigger, and Weaver Creeks, tributaries of the Upper Moyie, the balance of the section not having yet been prospected. On Moyie Lake there are 7 claims held under Crown grant, 66 certificates of work, and 41 new locations, and on the tributaries of Upper Moyie Lake there are 1 claim held under Crown grant, 21 certificates of work, and 25 new locations.

On the *Lake Shore* and *St. Eugene Groups*, which are now under one management, very extensive development work has been executed. An air compressor plant is at work, one ore concentrator is ready for operation, and another is under construction. Some thousands of feet of tunnelling have been constructed on the claims, and a large mass of ore blocked out. Shipments of ore were made during the past year, but were discontinued pending the completion of the concentrators. On the *Society Girl*, the development includes 225 feet of tunnelling and shaft; on the *Aurora*, on the west side of Moyie Lake, the development work includes 90 feet of tunnel work.

On the *Pay Roll Group*, on Nigger Creek, development work is in progress and will continue all winter. A sleigh road has been constructed from the mouth of the mine to the railway, and ore can now be shipped at a small expense.

On Palmer's Bar Creek there have been 35 certificates of work and 37 new locations.

WEST CENTRAL SECTION

Consists of the drainage area of the St. Mary's River, in which area 47 % of the mining claims of the Division are situated, including 46 claims held under Crown grant, 341 certificates of work, and 316 new locations.

In the immediate vicinity of Cranbrook there have been 16 certificates of work and 46 new locations. On these claims, little but assessment work has been done. They can all be reached by waggon roads, and should the ore prove valuable could be worked at a small expense.

On Perry Creek and Six-Mile Creek there are 6 claims held under Crown grant, 45 certificates of work, and 70 new locations. A waggon road connects Old Town on this creek with the railway. The Kootenay (Perry Creek) Gold Mines, Limited, is carrying on extensive development work to prove the value of its properties on this creek. The following information has been furnished to me by one of the officials:—"The work has proved that the veins continue in length and depth, and are gold-bearing to the point reached. The expense of transporting food and material over 30 miles of trail has been great. The surface explorations

include 1,000 lineal feet of pit and trench work, averaging 10 feet in depth. Shafts have been sunk 55 feet, and tunnels and adit aggregate 225 feet, in addition to 47 feet of cross-cutting. A cross-cut tunnel is being run with the object of intersecting the vein at a point about 500 feet from the mouth, and at a depth of 200 feet. Ninety-five feet of this tunnel has so far been driven."

On other streams entering the St. Mary's River from the south there are 27 certificates of work and 15 new locations; on Baker Creek and its tributaries, 29 certificates of work and 11 new locations; on the West Fork, there are 1 claim held under Crown grant, 35 certificates of work, and 38 new locations; on the North and East Forks, there are 15 certificates of work and 19 new locations. There has been much work done on the West, North, and East Forks, particulars of which I cannot obtain.

On Pyramid and Tamarac Creeks there are 14 claims held under Crown grant, 16 certificates of work, and 5 new locations. An extended description of some of these properties will be found in the Annual Report for 1897. There has not been much work done in 1899, the holders of the claims awaiting improved means of transportation.

On Alki Creek and St. Mary's Lake there are 5 claims held under Crown grant, 70 certificates of work, and 17 new locations. The principal development work has been on the *Blue Peter Group*.

On Matthew Creek there have been 6 certificates and 3 new locations.

On Mark Creek, including Huckleberry and Sullivan Hills, there are 20 claims held under Crown grant, 80 certificates of work, and 74 new locations. The *North Star Mine*, which shipped ore during the years 1897 and 1898, suspended shipments during 1899 pending the completion of the North Star Branch Railway. This railway will be ready to carry ore early in the year 1900, and a large quantity of ore is now awaiting transportation. On the *North Star Group*, development work includes about 2,000 feet of shaft, tunnels, and drifts. The ore is a galena, with a value of \$40 to \$60 per ton. From 50 to 120 men have been employed during the last year, and a new hoisting plant has been installed. A diamond drill has been in operation since September, 1899, and a wire tramway is in course of construction from the mine to the branch of the Crow's Nest Railway. An air compressor is being installed, and commodious quarters for the employees have been provided.

On the *Kimberley Consolidated Group*, to the south of the *North Star Group*, 250 feet of shaft and tunnels have been constructed.

On the *Midnight*, one of the *North Star Group*, 135 feet of tunnels and drifts have been run. On the *Stemwinder* claim development work has been in progress for some time, and an ore body of low grade has been found.

The *Sullivan Group* is situate on the opposite side of Mark Creek, and a waggon road connects it with the branch railway. Twenty men were employed on the property in 1899. A large ore body has been proved; it is a steel galena valued at about \$50 a ton. Further development work is in progress, and it is expected that shipment of ore will begin in the spring of 1900.

On other parts of Sullivan Hill much development work has been done. To the south-east of Kimberley lies the *Black Bear* mineral claim. The property has been equipped with hoisting plant and mining pump. The main working shaft, which is within a few feet of the railway, is down a distance of 100 feet, and a quantity of shipping ore is now on the dump. Development work has been done on other properties in this vicinity, and it is expected that the year 1900 will show a great increase in work, the facilities for transportation being now all that could be desired.

On St. Mary's Prairie and Luke Creek, to the east of Mark Creek, there are 22 certificates of work and 18 new locations. Descriptions of many of the claims may be found in last year's Report. Development work has been conducted on a small scale.

The St. Mary's waggon road now reaches Matthew Creek. Its extension to the North Fork would be of great advantage to about 300 mineral claims in various stages of development.

NORTH-WESTERN SECTION.

The North-Western Section consists of the drainage area of Cherry and Skookum Chuck Creeks. There have been 14 certificates of work and 41 new locations. A small portion only of this section has been prospected, there being few trails, and a large area of the country is impassable for horses, being covered with burnt timber, which has fallen down. The prospecting has so far been done by men on foot. The country to the north and to the south of it has been proved to be valuable, and the opening up of trails would lead to the prospecting of this section in a more thorough manner.

On the *Butte* and *Philadelphia* mineral claims development consists of 275 feet of tunnel work. A high grade copper ore has been found, which could be transported to the Kootenay River if a waggon road was constructed over eight miles of easy country. Waggon roads now connect the mouth of Skookum Chuck Creek with Fort Steele and Cranbrook. The navigation of the Kootenay River, from Skookum Chuck to Wardner, is comparatively easy.

The mining industry in this District has been in a state of transition during this year. The Crow's Nest Railway was opened at too late a date to be of much advantage in the transportation of supplies and machinery, except for mines close to its line. Machinery is now being installed, and the output will commence in 1900. The North Star Branch of the railway, which will be completed early in 1900, will shorten the waggon haul from all points in the West Central Section of the District from 20 to 25 miles, and thus decrease the cost of development. The proprietors of the *North Star Mine* and others in that vicinity, knowing that improved transportation facilities would be available in 1900, suspended shipment during the last year, and the only work done was that of development. A large business is certain for the year 1900, and I anticipate large mining receipts for next year.

OFFICE STATISTICS—FORT STEELE DIVISION.

Free miners' certificates issued to companies	8
" " " Substituted	6
" " " Special	11
" " " Ordinary	727
Mineral claims recorded	729
" " Partnership	4
Placer claims in force	1
" " Partnership	3
Mining leases issued	3
" in force	7
Entries in records of conveyance	305
" Miscellaneous records	797
" Record of abandonment	7
" Record of water grants	15
Number of affidavits filed	1,303
" other documents filed	85
Mining receipts	\$6,635.40
Revenue from free miners' certificates	3,922



CHINESE PUMPS ON PINE CREEK—ATLIN M. D.

PHOTO. KINDNESS MUIRHEAD BROS., ATLIN.



MINING SCENE ON PINE CREEK—ATLIN, M. D.

PHOTO. KINDNESS MUIRHEAD BROS., ATLIN.



NORTH-EAST KOOTENAY DISTRICT.

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REPORT OF J. E. GRIFFITH, GOLD COMMISSIONER.

I have the honour to report great progress in this District during the past year, not only from a mining point of view but from a general business standpoint; notwithstanding the setback caused by one of the worst years on record as regards the weather, the mining industry has been practically doubled.

There are eight camps at work this winter, employing 71 men, and from a conservative estimate it is anticipated that there will be from 1,000 to 1,500 tons of ore ready for shipping in the Spring. This District will then become, for the first time, a factor in the mining world, and from present indications it is safe to assume that the chances are very much in favour of rapid advancement.

To facilitate transportation the Government erected a draw-bridge across the Columbia River, at the Salmon Beds, and built eight miles of waggon road up Toby Creek; next Spring this will be extended thirteen miles to the mines. Should the winter's work on Horse Thief Creek turn out as anticipated, a branch road will no doubt be built up that creek at the same time, and with the advent of waggon roads, properties that are now lying idle will be developed.

SUMMARY OF OFFICE STATISTICS—NORTH-EAST KOOTENAY DISTRICT.

Free Miners' Certificates	478
Mineral Claims recorded	555
Placer Claims "	2
Placer Leases "	4
Records of Assessments	295
Mineral Claim transfers	226
Permission to relocate	2
Payment in lieu of work	3
Free Miners' Certificates to Companies	4

Following is a brief statement of the work done in the different Mining Divisions. Space will hardly admit mention of those claims upon which scarcely more than assessment work has been done.

DONALD MINING DIVISION.

Porcupine Group—This group, consisting of five claims situated on Quartz Creek, is now undergoing development, it being the intention of the owners to keep one shift on all the winter. As yet sufficient work has not been done to show depth, but the surface showing is good.

Little Brother Mineral Claim—This property has been practically at a standstill this season, owing to complications with the bondholders.

Prairie Mountain Group—There has been no actual development work done on these claims this summer other than assessments, owing to the claims being practically covered with snow all the summer.

Bald Mountain Group—Development work on the *Imperial* consists of a tunnel of 75 feet, and one of 62 feet on the *Marie Louise*.

Acorn, Chesnut and Anglo Saxon—These claims have a lead of about 40 feet in width, showing pockets of ore assaying \$112 to the ton, but sufficient work has not been done as yet to show up any large bodies of ore.

TETE JAUNE CACHE.

Owing to reports of the discovery of placer ground on Swift Current Creek, a tributary of the Fraser, a large number of men, with good outfits, went there to prospect, but with indifferent success, and although a little gold is found on the rim rock, the large boulders in the creek make the work too heavy to become a paying proposition.

QUARTZ CREEK PLACER MINING.

On an average three or four men have been working on this creek all the year sinking and ditching, a good deal being dead work so far. The output of gold was only about 20 ounces.

OFFICE STATISTICS—DONALD MINING DIVISION.

Free Miners' Certificates	43
Mineral Claims recorded	16
Placer Claims "	2
Mineral Claims transfers	7
Records of Assessments	26
Permission to re-locate	2

N. B.—The Donald Mining Division has now been absorbed by the Golden Mining Division—with Recording Office at Golden.

GOLDEN MINING DIVISION.

The *Certainty, Porphyry and Iron Hill Groups* are owned by the Certainty Gold and Mining Company, of Quebec. The following information was kindly furnished by the manager of the Company:—

This property consists of five claims. Development work was started **Certainty Group.** in July last, the number of men employed varying from seven to ten.

With the assistance of the Government, a trail was built for a distance of two miles and a half, and the work was continued by the Company, which built another two miles and a half.

The property is located on Fifteen-Mile Creek and is distant from Golden about fifteen miles, access to where the trail branches off being provided by the navigable waters of the Columbia River, or by waggon road from Golden.

The formation consists of quartzite and slate, traversed by porphyry dykes, and it is in the fissures in the quartzite, at the contact with the porphyry, that the ore deposits occur.

The altitude of the property is about 8,000 feet above sea level.

Work was continued steadily all the summer and as winter came on supplies were put in to enable development to be prosecuted during the winter months, full provision being made to carry the camp on till July next.

Comfortable quarters for the Company's workmen have been erected, consisting of cook house and dining room, bunk house to accommodate twelve men, root house and store-room.

The development consists of three tunnels. First, the low level tunnel which has been driven 240 feet and has developed a ledge in the contact between the porphyry and the quartzite, showing a body of ore assaying fairly well in copper and gold. It is in this tunnel that the work is to be continued during the winter. Sixty feet in vertical height above this tunnel a second tunnel has been run on the same ledge a distance of 75 feet, and shows an average of two feet of ore running from \$4 to \$9 per ton in gold and from $3\frac{1}{2}$ to $17\frac{1}{2}$ per cent. of copper per ton. At a point 280 feet higher up the mountain the third tunnel has been run for a distance of 147 feet, exposing three ledges all carrying ore. One of these ledges is 19 feet in thickness, another about 4 feet, and the third about 6 feet, with out-crop on the face of the mountain from 12 to 14 feet across. At the point of intersection by the tunnel this latter ledge was found to carry a pay streak of two feet of shipping ore. Work will be continued during the winter by the aid of a system of hot air ventilation, and if the results of the winter's development work are satisfactory it is the intention of the owners to put in an electric plant, operated by a water-power with over three hundred feet head, the right to 350 inches of water having been secured for such a purpose. By means of this it is intended to operate air compressors and power drills and so push development work much more extensively.

This property consists of two claims and a fraction. It is located on Porphyry and Iron Canyon Creek, and is 10 miles distant from Golden. The location was made on an out-crop of chalcopyrite extending over a width of 100 feet.

The country rock is slate and quartzite, and the slates are traversed by dykes of felsite. A tunnel has been run at each end of the out-crop and an open cut in the centre. The tunnels were run about 50 feet and developed a body of ore from 10 inches to $3\frac{1}{2}$ feet in thickness, in a vein from $2\frac{1}{2}$ to 6 feet in width. On this showing the holders of the bond decided to take it up and to put in improvements of a permanent character. Suitable buildings were erected to accommodate 24 men, and a sleigh road was built from Golden at a cost of about \$4,000—the distance being 10 miles. A cable tramway is in course of construction to convey the ore from the mine to a loading station at the terminus of the sleigh road. One tunnel has been driven 76 feet and the other 121 feet. In the latter there has been a continuous shute of ore developed, showing a width of from 4 inches to $3\frac{1}{2}$ feet, while the concentrating ore extends to 6 feet in thickness. Drifts have been run from each tunnel to prove the ground, and these now cover a lineal distance of 100 feet. A quantity of ore has been sorted and sacked for shipment, and about 200 tons of milling ore is on the dumps. The owners have made arrangements to push development work as rapidly as possible, about 24 men now being steadily employed at the camp. The vein on which the work has been done lies very flat, varying in dip from 10 to 30 degrees. The ore is a chalcopyrite, carrying up to 23 % iron and 20 % sulphur; silica varies from 15 to 25 %. If development during the winter months should prove satisfactory it is the intention of the owners to put in an electric power plant, air compressors and power drills in the Spring.

Bennison Group. This very promising property has been practically at a standstill, apparently the result of internal troubles in the affairs of the Company.

Canyon Creek Placer Mining.—A considerable amount of work has been done and is at present under way, but with what success is not yet known.

Copper Ridge Group. Development work, consisting of 60 feet of tunnelling and 27 feet of cross-cuts, constitutes this season's work. The vein is 11 feet wide, pretty well mineralized with chalcopyrite.

OFFICE STATISTICS, GOLDEN DIVISION.

Free Miners' Certificates	232
Mineral Claims recorded	157
Placer Leases	1
Mineral Claim transfers	70
Records of assessments	89
Payments in lieu of work	3
Free Miners' Certificates to companies.	4

WINDERMERE MINING DIVISION.

Delphine Group. This group, situated on the North Fork of Toby Creek, looks very promising. The owners did considerable work themselves, shipping a carload of ore to the Trail Smelter, which netted them a handsome profit, and they have another carload at Athelmer—the Salmon Beds—ready for shipment when navigation opens. Subsequently, they bonded the property to a Toronto company, and development work is now being vigorously pushed. Extensive quarters for the 13 men being employed have been erected close to the mine and fully provisioned for a long seige of Winter. At the present time, 60 tons of high-grade ore are in the bins, which will run over \$100 to the ton, and it is estimated that there will be several hundred tons out by the spring. A sleigh road, about 5 miles long, is about to be built from the mine to the main creek, it being the intention of the Government to build a waggon road, or rather an extension of the one started from Athelmer this Fall, to the mouth of the North Fork, where the *Delphine* ore will be stored.

Hot Punch Mineral Claim. There was no work done on this property this year.

Mineral King Mineral Claim. This property has been idle for some time past. The work consists of a 50-foot tunnel, which, however, did not strike the ore body. The owners are now taking it in hand again, and have put in a camp with the intention of working a small force of men all the winter.

Silver Tip Group. This group is said to be very promising, the owners have prepared a winter camp and are employing 3 men.

Diamond C. Group. Situated on Spring Creek, near the *Paradise*, has a good surface showing. It is the intention of the owners to work all the winter.

Kootenay Queen Mineral Claim. This property is under bond. Three men were employed all the summer doing development work, which was proving very satisfactory.

This group consists of 3 claims, situated at the head of Spring Creek, **Paradise Group.** a tributary of Toby, and is distant from Athelmer 17 miles, 8 of which are by waggon road. There is also access by trail from Boulder Creek. The surface showing of sand carbonates is immense. This being a very recent discovery, not much work has been done as yet. An open cut on the west end of the *Paradise*, 33 feet long, 6 feet wide, and 4 feet deep, shows lead carbonate throughout. A cross-cut tunnel has been run from the same point, 82 feet long. The tunnel was then turned along the vein, on the foot-

wall, for 50 feet, and runs entirely in ore for that distance. The lead carbonates, as greater depth is reached, contain a considerable quantity of solid galena. The lead can be traced at intervals over all the three claims, the country rock being slate and lime (dolomite). The group is at present under bond. A winter camp has been put in, 7 men being employed with the intention, if the weather permits, of working all the Winter. It was not expected at first that this could be done, owing to the trail not being in good enough shape for packing. This being one of the groups from which a large output of ore was expected for shipment next Spring, it is to be hoped that the bondholders will be able to keep things moving.

Development work consists of an open cut and some 41 feet of tunnel.

Dragon. This intersected a mineralised seam, 25 feet from the mouth, and passed through it, the ore dipping beneath the inner part of the tunnel, being seen again near the junction of the tunnel, and a winze sunk from it at 41 feet from the mouth.

The ore streak on the west side of the winze has an average width of 17 inches, dipping northerly towards the inner part of the tunnel; in the inner face of the winze the ore streak is 12 inches wide. A sample from both contained 8% copper, 40 cents gold, and \$1.20 silver. It is a good concentrating ore.

HORSE-THIEF CREEK.

This group of claims is situated on Boulder Creek, and is under bond to a Toronto company. A considerable amount of work has been done, about 15 men being employed the best part of the summer. The results, however, proved a little disappointing, as compared with the surface showing. The bondholders have faith in it, nevertheless, and it was their intention to have put in a winter camp, but, owing to bad weather, this was found impracticable.

Delos mineral claim. It was anticipated that development work would be rushed on this group this summer, but it did not materialize.

Pretty Girl Group. This year's work consisted of a deepening of the shaft about 40 feet, and in a cross-cut from the main tunnel. The showing at the 60-foot level in the shaft averages 2 feet of clean ore (tetrahedrite), assaying 22.5% copper, 40 ounces silver, and \$3 gold.

Silver Thread Group. Situated near the head of Law Creek. This group has a very fine surface showing, and considerable work has been done on the *Silver Thread* claim itself, under very trying circumstances. The weather, combined with the altitude of the claim and distance from timber, made progress necessarily slow and expensive, but the bondholders pluckily stuck to it, for which they deserve credit. A winter camp, under the circumstances, could not be put in. It is very probable that next Spring work will be commenced on one of the lower claims, which are much easier of access, although the showing, whilst very encouraging, is not as good as that seen on the *Silver Thread*.

Red Line Group. Situated on the Red Line Creek, a tributary of McDonald. The first trail was put in from Law Creek, but in order to avoid crossing a high summit the bondholders built a trail up McDonald Creek, which has a much better grade. The group is under bond to the same company as is the *Silver Thread*; it was re-bonded to a Rossland syndicate, which, however, failed to take it up. The best part of the summer was therefore lost, but, with characteristic energy, the original bondholders went to work to develop the property, the trails alone costing them in the neighbourhood of \$3,000. Stables have been built at Peterborough and at points on the route, as well as good quarters within half a mile of the mine. The outcropping of ore on the lead, which can be traced

over the summit, a distance of about half a mile, is very encouraging. At a point near and above where the tunnel starts, the ore body is 16 feet wide, assaying 3% copper, with silver values. It is reported that the lead has been struck in the tunnel, but there are no particulars at hand, though it is intimated that the strike gives satisfaction.

Swansea mineral claim. Situated near Windermere. A considerable amount of development work has been done on this claim this summer, five or six men being continually employed. It was expected that about 100 tons of ore would be hauled out this winter.

There are numerous claims on Toby and Horse Thief Creeks claimed to have fine surface showings, but as it snowed practically all summer it was impossible to do any work other than assessment and building trails. It is confidently anticipated, however, that the development now going on will be the means of getting waggon roads and trails where none now exist, which will materially assist prospectors in their work, and thus get capital interested. The same may be said of No. 2 Creek country, where, judging from reports, some excellent claims have been staked, but there is practically no access to them as yet, other than rough prospecting trails. Taking everything into consideration, the outlook for the Windermere Division is very bright.

OFFICE STATISTICS—WINDERMERE DIVISION.

Free miners' certificates	203
Mineral claims recorded	382
Records of assessments	180
Mineral claim transfers	149

NORTH-WEST KOOTENAY DISTRICT.

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REPORT BY H. N. COURSIER, GOLD COMMISSIONER.

There has been no unusual activity in this District this past year, and the general development has been very much retarded by the unprecedented lateness of the opening of the season, last Spring being five or six weeks behind the usual date.

The cold weather was prolonged well into the summer time, leaving our short mining season yet shorter, and scarcely had the snow disappeared from the elevation of the average claim when steady, persistent rain began to fall, continuing for weeks, and interfering seriously with work in the hills.

Notwithstanding these drawbacks, some of the Divisions have displayed much energy, and marked progress has been made, as may be gathered from the reports of the Mining Recorders which follow.

The surface showings of mineral in North-East Kootenay are unquestionably very strong, and the question naturally arises—why have they not been more generally productive? The answer seems to me to be found in the lack of transportation facilities, which has discouraged proper development.

The substantial hope of early railway accommodation has caused—notwithstanding the bad weather—such a marked advance in the development of the Trout Lake, Ferguson, Fish Creek and Pool Creek camps that, when the railway from the south, now heading in their direction, reaches them, it is expected that many of them will have considerable amounts of ore ready for shipment.

Recent finds in the vicinity of Pool and Fish Creeks, in the Lardeau District, with large surface showings, indicate free gold in considerable amount.

Some of these locations have already been bonded to strong companies, and development will prove, in the near future, the extent and permanency of what appears to be an exceedingly rich locality

REVELSTOKE MINING DIVISION.

THE BIG BEND.

The Big Bend country, at the northern end of this Division, did not attract more than the usual number of prospectors this year, but the extent of the actual development work done has far surpassed that of any previous year.

In almost every instance, when the work was performed in a manner and to an amount to fairly test the locations, well defined leads were proved to exist.

GROUND HOG BASIN

Is situated at the head of McCullough Creek, at a considerable altitude, and was in constant snow for the greater part of the season, so that little more than assessment work was done on

any of the claims. That this was done is indicated by the fact that some thirty certificates of work were issued for this particular camp this year.

FRENCH CREEK.

Across the summit, to the south of Ground Hog Basin, is the French Creek slope, at the foot of which flows the creek from which it takes its name.

On this creek is the large and expensive hydraulic plant, laid out during the past two seasons by the French Creek Mining Co., but which has not produced returns to the extent anticipated, as the greater part of the gravels had previously been worked out, a fact which was not discovered until after the completion of the expensive plant referred to.

Consolation Diggings. Further up the creek are located the Consolation Diggings, which have produced gold in varying quantities for the past twelve years, and still continue in operation.

The present management has just completed a large amount of preliminary work, and hopes early in 1900 to be able to report a clean-up.

MCCULLOUGH CREEK.

Ophir Claim. On the *Ophir* claim, at the mouth of McCullough Creek (which claim was tied up for so many years in litigation), the Ophir Co. did considerable satisfactory prospecting during the past season, in preparation for carrying on more extensive work next year. This location is particularly well adapted for hydraulic mining, the creek having a very rapid fall towards Goldstream.

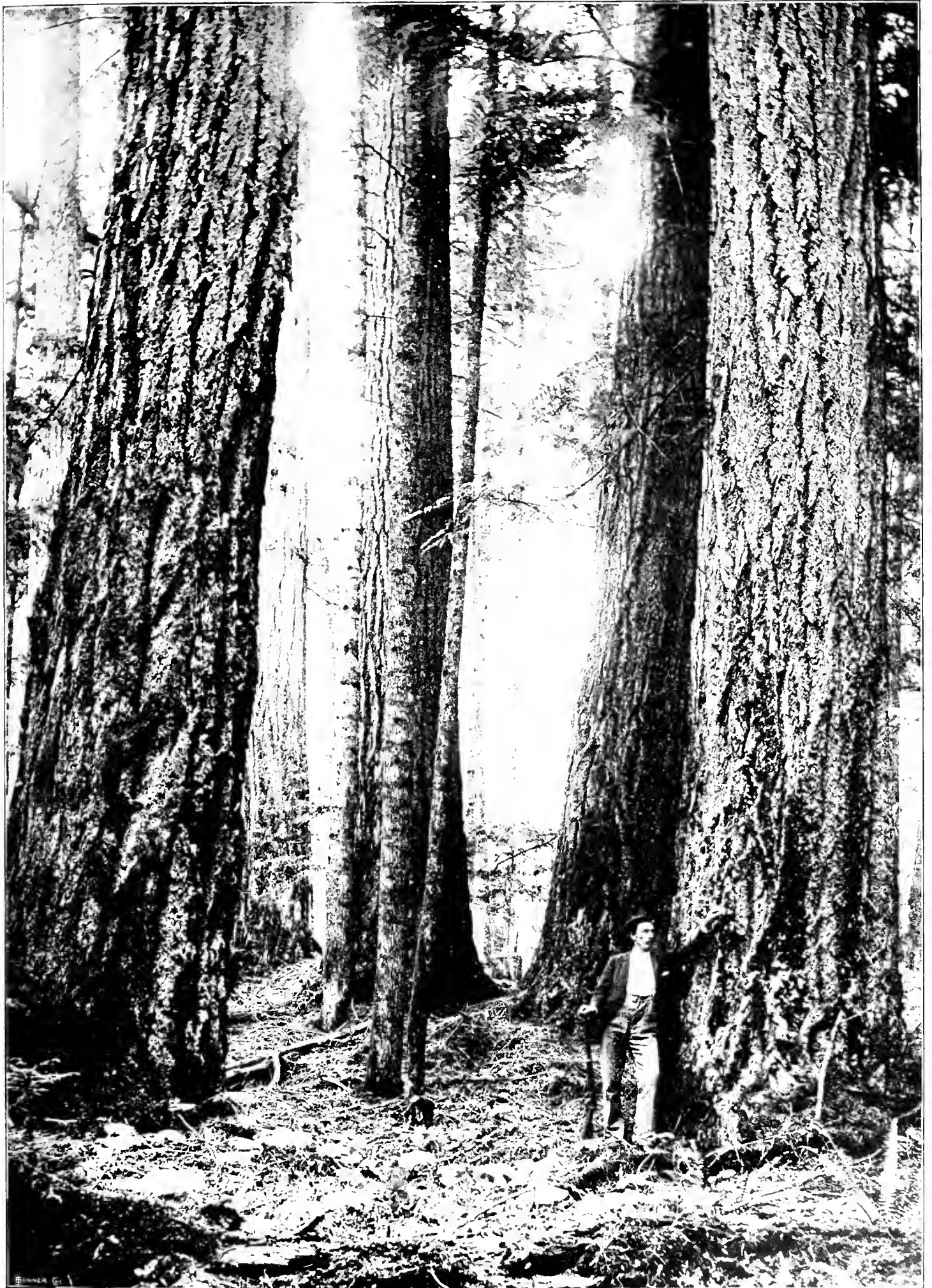
McCullough Creek Tunnel Co. Higher up McCullough Creek, the McCullough Creek Tunnel Co. has erected a large and substantial plant for deep digging. Work sufficient to comply with the Placer Act was done during the year, and operations were actively pushed pending a proposed arrangement for working the claim on a larger scale than has been done hitherto.

SMITH CREEK.

On the west side of the Columbia River, and about one mile north of Smith Creek proper, is a hydraulic plant operated by Messrs. Howard and Swords, the output of which has been varying, and the average not above good miners' wages.

Revelstoke Mineral Claim. A number of locations have been made on Smith Creek during the past season, but the only work done sufficient to reach pay gravel was on the *Revelstoke* claim, on which a shaft was sunk to a depth of about 107 feet, when rim-rock was reached, which had a slight inclination toward the river bed. Although the handling of gravel, boulders, etc., was done at a considerable disadvantage, in consequence of the long hoist, yet work on the rim so far has produced \$15 per day per man in coarse, scaly gold. The aim, however, of the present operators, was not so much to mine as to prospect the ground, with a view, if satisfactory, of establishing a more powerful plant. Toward the close of the season a break in the water-wheel used for pumping prevented the workers from reaching the lower bed-rock proper, but when this is accomplished, as it probably will be by sinking some 12 or 15 feet further, there are strong probabilities that the claim will pay well.

Blue Jay Claim. About half a mile further up the stream, another shaft has been sunk, on what is now the *Blue Jay* claim, to a depth of 110 feet. The wash-up from the shaft gravel all the way down produced scaly gold of medium size, though not in quantity sufficient to pay for mining. The object of this shaft was also to test the bed-rock.



FOREST OF DOUGLAS FIR—VANCOUVER ISLAND, B. C.



DOWNIE CREEK.

The next creek of importance is Downie Creek, which flows into the Columbia River some 17 miles south of Goldstream, into which (Goldstream) flow the waters of French, McCullough, and other creeks. The principal claims here are the *Waverley* and *Tangier Group*, both of which are closed down at present, after spending some \$15,000 in development. Seven certificates of work were issued in respect of other claims, and two new locations have been recorded.

KEYSTONE MOUNTAIN.

Keystone Mountain, from whence originate the waters of Keystone Creek, has had 30 new locations during the past year, and 14 certificates of work have been issued to various other claims. There is a large iron capping here, and in one of the more developed claims a very fine ledge of galena and grey copper has been struck. The altitude of this camp is about 7,000 feet above sea level, and it is consequently subject to heavy snowfall, but with the undoubted quantity of mineral present, and with the facilities for shipping that it possesses, it is a place well worth the attention of speculative capitalists.

STANDARD BASIN.

This is situated about 5 miles from the Keystone, and is a little higher, perhaps 700 or 800 feet. In this camp there have been 3 new locations recorded and 21 certificates of work issued during the past season. The locality has been brought into notice by the Boston and B. C. Copper Mining and Smelting Company, the property of which is by far the best developed of any in the neighbourhood. All arrangements for steady winter's work seemed complete, commodious cabins having been built, and an ample supply of provisions sent up, but, owing to some most unfortunate hitch in the Company, all work was suspended and the men discharged. The cause was certainly not the want of visible ore on the claim, as there is a very fine showing.

CARNES CREEK.

On this creek the principal set of claims is that known as the *Rosebery Rosebery Group*. *Group*, comprising 10 claims, all owned and being developed by the Carnes Creek Consolidated Co., Limited. Development work has been continued throughout the past season with a view to placing the property on a thorough working and producing basis. On the *Rosebery* itself, an upper tunnel was driven to prove the lead, and continued for over 100 feet, assays being made frequently of the ore (arsenical pyrites, carrying gold), which were highly satisfactory. A lower tunnel has been driven some 350 feet, exposing the same kind of ore, but with some yellow copper (chalcopyrite) showing. As this lower tunnel is deep enough to prove the ore body continuous for at least 200 feet from the surface, there should be a mine here in the near future. Very comfortable cabins for stores, sleeping, and eating, have been built convenient to the property, whilst a third tunnel has been commenced at a still lower depth. A large ore bin has been constructed to receive the output of the mine, and it is proposed to construct an aerial tramway to a convenient point on the North Fork of Carnes Creek, whence the existing trail (to the mouth of Carnes Creek) can be readily widened for rawhiding the ore out to the Columbia River. Once there, river steamers can take it to Revelstoke, to connect with the C. P. R., or can pursue their way down the river to the smelter at Trail. The development of these claims has been prosecuted under unavoidably high transportation expenses.

Seventeen certificates of work have been issued during the past year to claims other than the *Rosebery Group*, and 16 new locations recorded in this camp.

To the south-east of the *Rosebery Group* are located numerous other mineral claims held by individual prospectors, many of which, with the limited amount of work performed on them, show ore similar in character to that in the *Rosebery*, and are being held at valuations which cannot long remain overlooked by mining capital.

Extending from the *Rosebery Group* across the North Fork of Carnes Creek and up the slope across the ridge that separates Carnes Creek from Standard Basin is a mineral belt of iron capping with strong indications of copper, the greater portion of which is occupied by recent mineral locations.

LAFORME CREEK.

This creek empties into the Columbia River about 8 miles south of Carnes Creek and 20 miles north of Revelstoke. There are 39 claims upon it, of which 11 were new locations last year. The ore generally assays well in silver, copper and lead. The camp also contains ore very similar in appearance to the Rossland ore, and is certainly one of the promising camps of the Big Bend. In the immediate neighbourhood is the *Adair* or *Eureka Group* of claims, on which very considerable work has been done, especially on the *Eureka* claim, where between \$2,000 and \$3,000 has been expended, and substantial preparations made for the more permanent development of the property next season. When work was concluded for this winter, the owners reported having tunnelled into a vein of chalcopyrite over two feet thick

JORDAN PASS.

No new locations have been recorded in this camp owing to the lateness of the season, which kept many of the old locations beneath the snow all the summer. For the same reason very little actual development work was done, the assessments being performed by labour applied on trails, of which four miles were built, and which will prove of the greatest service in the future by supplying much more convenient access to the claims.

ISAAC CREEK CAMP.

This camp is situated some 12 miles from the mouth of Isaac Creek, which empties into the Columbia River about 16 miles south of Revelstoke. Some 14 new locations have been recorded, and 15 certificates of work issued for this camp during the past season.

The greatest amount of work performed on any one location was that done upon the *Hecla*, one of the *Hecla Group*, where a tunnel was run in 112 feet, which is expected to cut the ledge in another 40 feet, at a depth of 140 feet from the surface. Surface croppings from this group yielded on assay from \$5 to \$14 in gold values, and while these are not very high, yet the size of the leads and their character, which is chiefly arsenical pyrites, render it an extremely promising camp.

The following yearly statistics for the Division are reported by Mr. Fred. Fraser, Mining Recorder:—

OFFICE STATISTICS—REVELSTOKE DIVISION.

Free miners' certificates issued	302
Claims recorded	85
Certificates of Work issued	212
Crown grants issued	21
Transfers recorded	37
Options "	2

The following special report by H. N. Coursier, Gold Commissioner, is herewith appended :—

THE DRAINAGE AREA OF FISH RIVER.

In the outside world very little is yet known of the Fish River District. If the claims upon development, prove to be as rich as some of the surface showings now indicate, we can safely say that we have a Mining Camp. Some few claims were located on Fish River a number of years ago, and quite a lot of prospecting was done in 1898, when some promising claims were staked, but not until late in the summer of 1899 did people commence to realize the great mineral wealth of the District. Some very large leads of quartz located near the mouth of Pool Creek (a tributary of Fish River), which have been for years passed over by the prospector, who was looking for galena only, have been recently proved to carry very fair values in gold.

Last summer, a little galena and copper being found in one of these leads, it was staked and some work performed, when a lot of free gold was discovered scattered through the quartz, which, when assayed, gave splendid returns in gold. Since this find a great number of claims have been located. The latest find was made on Pool Creek in November. Five claims were staked on a lead 20 feet wide, the samples assaying well in gold.

The principal creeks tributary to Fish River, on which mineral has been found, are Pool, Mohawk, Lexington, Ruby Silver and Boyd Creeks, on the east side, and Menhenick, Scott, Sable, McRae and McDougal Creeks, on the west side.

POOL CREEK

Is situated at the head of Fish River Canyon, about seven miles from Comaplix and Thompson's Landing. Some very promising properties are located on this creek, five groups of claims having recently been bonded. At the head of Pool Creek is the *Wide West Group* of four claims. This group has a very big showing of ore, assaying well in gold, silver, copper and lead.

The *Lardeau-Goldsmith Group* of four claims has some very high grade silver ore. A 50-foot tunnel has been driven on this property.

The *Hunter and Trapper Group* of three claims, situated just south of the *Wide West Group*, has an open cut put in on the lead, and is showing up some very fine grey copper ore.

These groups, situated near the head of Pool Creek, on the south side, **Bismark and Athens Groups.** are properties of great merit. The owners, who are Rossland people, have just completed a large cabin, and will commence operations in the spring.

The *Alma Group*, three claims and a fraction, situated further down Pool Creek, has a very good showing of ore. Development work will be started on this group in the spring.

The *Western Star Group* of two claims, situated on the same lead as the *Alma* and *Black Bear*, is another promising location.

Further down Pool Creek, about $2\frac{1}{2}$ miles from its mouth, is the **Pontiac Group.** *Pontiac Group* of five claims. This is a free-milling proposition, located late last November.

The *Consol Group*, situated just below the *Pontiac Group*, has a large quartz lead carrying silver and copper.

The *Mohawk Group* of three claims, is about two miles from the mouth of Pool Creek, on the south side of the creek.

The *Moscow Group* of three claims, situated on the opposite side of Pool Creek from the *Mohawk Group*, has some very good-looking ore.

Other good claims near the *Moscow* are the *Revenue*, *Harvey* and *Estelle*. Just below the *Mohawk Group* is the *Eclipse Group* of three claims, one of the recent finds of Pool Creek, being located late last fall. It has a splendid showing of galena.

Further down Pool Creek, about three-quarters of a mile from its mouth, we have the *Franklin Group*, the lead on which is quartz with iron sulphides carrying gold and silver.

The *Eulie Group* of two claims, staked late last summer, and situated about half a mile from Fish River, is a big quartz and iron lead.

The *Clara Group* of three claims, south of the *Eulie Group*, and located last August, has a nice showing of copper ore.

The *Pirate King Group* of two claims, located last summer, and situated at the mouth of Pool Creek, has a quartz lead carrying values in silver and copper.

The *Ducette Boudrier Group*, located last October, situated on the south side of Pool Creek, two miles from Fish River, has a well-defined strong lead, on which three men are now driving a tunnel, and will work all the winter.

The *Blakemore Group* is another new location on the south side of Pool Creek, about a mile from Fish River.

MOHAWK CREEK

Flows into Pool Creek, about two miles from its mouth. Some very rich properties are situated on this creek. The famous *Beatrice Group* is located here, which consists of five claims, and has a fine showing of high grade ore, a shipment of 60 tons made last winter returning the handsome sum of \$103 per ton. The *Beatrice Group* has lately been bonded by Chicago capitalists, who now have a big force of men working. Cabins, stables and ore sheds have been put up at the mouth of Pool Creek, and rawhiding will continue throughout the winter. A great number of claims have been located in the vicinity of the *Beatrice Group*, some of which will, with development, prove to be very valuable. The *Carbonate Hill Group* of five claims has a good showing of high grade galena. Work is now being pushed on the *Silver Dollar*, the tunnel being in 100 feet. The lead has just been struck.

The *Mountain Boy Group* of two claims, situated north-west of the *Silver Dollar Group*, has a nice showing of ore similar in character to that of the *Silver Dollar*. A 100-foot tunnel has just been completed on this group.

The *Silver Crown* claim, situated between *Beatrice* and *Silver Dollar Groups*, has a fine looking quartz lead.

The *Smith Group* of two claims, situated at the forks of Mohawk Creek, has a well-defined lead, and a very promising showing. A tunnel is now being driven on this property. Between the forks of Mohawk Creek and Pool Creek a lot of claims were staked last summer.

LEXINGTON CREEK.

Lexington Creek flows into Fish Creek, about four and a half miles above Pool Creek. A great number of claims are located near this creek, nearly all of which have large surface showings, although the ore is rather low grade. The great Lexington lead is situated near this creek, and is traceable for a long distance, 23 claims being staked on it, and nearly all showing large bodies of ore. The *Kitsap*, *Lone Star*, *Lexington*, *Black Diamond*, *Index* and *Ophir* are well-known claims located on this lead.

The *Nellie Group* of four claims, situated on the north slope of Lexington Creek, has a cross-cut driven on the lead.

The *Silver Bow Group* of two claims, situated on the north slope of Lexington Creek, is one of the high grade propositions of the camp.

Another group of four claims, situated on the north slope of Lexington Creek, is the *Lardeau King*, on which a tunnel is now being driven to cut the lead at a depth of about 100 feet, the surface indications being promising.

The *Sitting Bull Group* is situated on same lead as the *Lardeau King*.

The *Daffodil Group* of three claims was located last summer and some work has been done.

The *Republic Group* of four claims, situated near the mouth of Lexington Creek, is another new location which has just been sold to Montreal parties.

RUBY SILVER CREEK.

A group of good claims is located on Ruby Silver Creek, which flows into Fish River just north of Lexington, known as the *Union Jack Group*, and having a well-defined lead carrying ore which gives very satisfactory returns in silver, copper and lead.

BOYD CREEK,

Is situated about nine miles north of Pool Creek. The well-known *Glengary and Kootenay Chief Groups* are situated at the head of Boyd Creek. The ore is galena, assaying 100 oz. in silver and 40 % lead. Considerable work was done on the *Glengary* claim last summer, and a small shipment of ore has been made.

Farther down Boyd Creek we find the *Trelawney and Cheviot Groups*, supposed to be on the same lead as the *Glengary*.

The *Westward Ho Group* has some nice ore, similar in character to that of the *Glengary*.

Still further down Boyd Creek is the *Anaconda Group* of four claims. Some very good ore has been taken from this group, giving good values in gold and copper. A tunnel 110 feet long has been driven on this property.

MCDUGAL CREEK,

Situated north of Boyd Creek. Some big iron leads have lately been staked on this creek. The ore bears a great resemblance to the Rossland ores, and recent assays give fair returns in gold and copper.

MCRÆE CREEK.

On McRae Creek several new locations have been made, and some good-looking rock has been found.

The *Thelma Group*, situated just below McRae Creek, is another new location which promises well. It has a big quartz lead, carrying copper.

SABLE CREEK.

Sable Creek flows into Fish River from the west, about four miles above Pool Creek.

The *Trilby Group*, on the North Fork of Sable Creek, has some high grade ore in sight. Work will be proceeded with in the spring.

The *Revenge Group*, near the *Trilby*, was located last summer.

The *Comstock Group* of three claims, at the head of the North Fork of Sable Creek, has one of the biggest showings in the camp.

On the Agnes Branch of Sable Creek is located the *Agnes Group* of two claims. This has a very big lead of concentrating ore, which assays in gold, copper and silver.

The *Kentish Maid Group* is on the same lead as the Agnes, but on the opposite side of the creek, and the *Britannia Group* is just below.

Two groups of claims, situated on the Stephnie branch of Sable Creek, cannot be passed over without comment. These are the *Cornishman* and *Manxman* groups, with two claims in each. The lead is very wide, and the ore assays \$4 in gold and 90 oz. in silver, with some copper and lead.

MENHENICK CREEK

Is on the west side of Fish River, about $1\frac{1}{2}$ miles above Pool Creek. Since last spring, two parallel leads, about half a mile apart, have been staked from the mouth of Menhenick Creek to the head of Scott Creek. One of the claims was tested with a diamond drill last Fall, and at a depth of 50 feet some 18 inches of galena was struck.

SCOTT CREEK.

Scott Creek is just north of Menhenick Creek. The *Copper King* group of three claims, a copper proposition, is near the head of the creek. Some splendid ore has been taken out of the claim, assaying 30 % in copper.

The *Sunset Group* of two claims, also near the head of Scott Creek, has very rich grey copper ore. The *Lost Cup Group* of four claims, on Scott Creek, has a good ledge of quartz, with iron and some galena.

MINERAL HILL.

Mineral Hill, which lies just north of Pool Creek, is, from present indications, likely to be rich. All the claims are in heavy timber, and nearly all were staked last summer.

The *Eva Group* of two claims, located last July, is a free-milling proposition. Some of the quartz from these claims assays from \$30 up per ton in gold. The width of the lead is 30 feet. This group was recently bonded to Montana parties, who have just finished putting up cabins, and will keep a force of men at work all the winter. The latest report from this group is that the quartz taken from the end of the tunnel, which is in over 30 feet, is as rich as samples taken from surface.

The *Oyster Group* is another likely looking, free-milling proposition, very near the *Eva Group*, and the quartz is identical with that of the *Eva*.

The *Brunswick Group* of two claims is situated just north of the *Eva*. Some good ore is showing on this claim, and a small shipment has been made.

The *Highland Mary* and *Last Chance*, situated near the *Eva Group*, are good prospects which ought to turn out well.

Another galena find, which was located last summer on Mineral Hill, is on the *Conmore and Lucky Jack Group* of five claims. There is a foot of shipping ore on the *Conmore* claim.

The *St. Joe Group* of three claims is on a lead parallel with the *Conmore* group, and has a very fair surface showing.

The *Imperial Group*, situated about half a mile north of the mouth of Pool Creek is a free-milling proposition, of which great things are expected.

Just north of Mineral Hill, on the Fish River slope, lies the big *Kingston Group* of seven claims. Two nice-looking leads run through this property. A cabin has just been finished, and work will commence as soon as possible.

A large number of additional claims have been staked on Fish River this last summer, particulars of which are not to hand at present.

To the capitalist and prospector, Fish River District holds forth great inducements, as the claim holders, in the majority of cases, are willing to sell or bond their claims at reasonable figures.

ILLECILLEWAET MINING DIVISION.

REPORT BY WALTER SCOTT, MINING RECORDER.

The following is an account of the various mining properties in this Division:—

HEAD-WATERS OF FISH RIVER.

The *Dunvegan* mineral claim has had 300 feet of tunnel driven on it. Some 100 tons of galena ore have been shipped.

The *Alma* mineral claim is a southerly extension of the *Dunvegan*. A tunnel has been run on the vein for about 100 feet, exposing a very fair showing of galena.

The *Scotia*, *Elizabeth* and *Edinburgh* group of mineral claims has good surface showings. A tunnel has been run 160 feet to tap the vein, and a shaft 80 feet deep has been sunk. There are some 10 tons of ore on the dump, assaying well in silver and lead.

The *Annie* mineral claim is a southerly extension of the *Scotia*. A tunnel has been run 150 feet along the vein, showing galena. A good sized pile of shipping ore has accumulated on the dump.

The *Agnes* mineral claim, a southerly extension of the *Annie*, has a good surface showing, and a tunnel some 80 feet deep.

The *Herringback* and *King Solomon* are southern extensions of the *Agnes*, with good surface showings, and a tunnel now in about 40 feet. Ore, galena.

These same claims—just mentioned are located on a strong vein about 8 feet wide, carrying ore along the hanging wall, but are as yet undeveloped.

There is a plentiful supply of both timber and water on the claims.

NORTH FORK.

Jumbo mineral claim is situated on the North Fork slope, and has a large quartz vein outcropping—in one place 9 feet across—in which a tunnel has been driven 130 feet, while another tunnel further down the mountain has been driven 110 feet. The quartz in the faces of these tunnels is fairly well mineralized.

There is supposed to be 180 tons of concentrating ore on the dump. The concentrates are said to assay over 300 ounces in silver to the ton.

Georgie and *Reggie* mineral claims are situated on the North Fork, almost 19 miles from Albert Canyon, and a tunnel has been driven 160 feet. A lot of 4 tons of selected ore was shipped to the Trail smelter, and gave very satisfactory assays in gold, silver and copper.

Round Hill mineral claim. On this claim there has been sunk a shaft 24 feet deep, showing at the bottom a large deposit of galena and carbonates. Another shaft has been sunk 45 feet, and a tunnel of 150 feet driven, both showing galena in quartz.

Donald mineral claim.—On this claim a shaft has been sunk 84 feet, showing ore at the bottom, and a tunnel has been run some 300 feet to tap the vein. The ore is a mixture of galena, pyrrhotite and blende, carrying silver values.

Blue Bell mineral claim is situated about 1 mile south-east from Illecillewaet; a shaft has been sunk 45 feet, and a tunnel driven 140 feet, to tap the vein. Ore, galena. Some 5 tons were shipped to England.

Silver Bow, *Copper Crown* and *Copper Hill* mineral claims are situated 7 miles north of the C. P. Ry. track at Flat Creek. Two tunnels have been driven on these claims, one 90 and the other 70 feet. Some 18 tons of ore are said to have been shipped, which yielded good returns, values being in copper and gold chiefly.

Sanquhar mineral claim is situated 2 miles north of Illecillewaet. On this claim a shaft has been sunk 30 feet, some 12 tons of ore from which were on the dump. In another place a tunnel was run 90 feet to tap the vein, when a drift on the vein was run some 30 feet. Ore, argentiferous galena.

Summit Lode mineral claim is a southerly extension of the *Sanquhar*. A tunnel has been run 90 feet to tap the vein, from which a drift 40 feet long has been made on the vein. The ore is a galena, carrying good silver values.

North Star mineral claim is situated near Ground Hog Basin, but in this Division, and about one mile from the *Jumbo*. On this claim a tunnel has been run in about 140 feet to tap the vein. There is a very nice showing of galena on the property, carrying good silver values.

The *Lanark Mine*, near Laurie Station, on the C. P. Ry., upon which so much work has been done, and which had its concentrator at the railway connected with the mine by a wire rope tramway, has been shut down all this year, and no definite information is obtainable as to whether it will start up again. The mine has been stoped to the 400-foot level, where the ore body was cut by an 800-foot tunnel, but the ore below that level has not been touched. The ore is a concentrating galena proposition, concentrates running about 55 to 60 ounces silver to the ton and about 70 % lead.

LARDEAU MINING DIVISION.

REPORT BY GEO. SUMNER, MINING RECORDER.

I have the honour to submit herewith my report on the mining development in the Lardeau Division for the past year.

This division includes the water-shed of Upper Arrow Lake, from a point 4 miles north of Nakusp to a point 20 miles up the Fish River.

Very little actual mining is done outside of the Fish River Camp, which extends from the mouth of Fish River up to McDougall Creek, a distance of about 20 miles, at which point the granite makes its appearance, with a north-west strike, cutting across the valley of Fish River.

FISH RIVER.

Although most of the mineral claims are located on the tributaries of Fish River, still, on Fish River itself, some very promising claims have been lately discovered. I refer more particularly to the discoveries of free gold made this season on the *Iron Dollar* and *Eva* mineral claims, which have already been bonded for \$50,000 to Spokane parties. Free gold is visible in the quartz from these claims. The parties who have the claims under bond seem very willing to spend money on development. They have a force of men at work, making a trail leading from the Government trail to the claims and building a cabin. They have also let a contract for a 100-foot tunnel.

POOL CREEK.

The *Beatrice Group* is so far the most important set of claims on Pool Creek, and consists of the *Beatrice*, *Folsom*, *Edmond*, and *Florence* mineral claims. The work has all been done on the *Beatrice*, and has shown this property to be very valuable. The ore is argentiferous galena. The average content of silver is stated at \$85 per ton, with a high percentage of lead, while special shipments are said to

have gone as high as \$160 per ton. About 70 tons were shipped to the smelter this summer. A force of men, under the direction of Mr. H. G. McCulloch, is now engaged in putting in a rawhide trail, repairing the cabins, etc., the intention being to ship ore this winter. All the ore, so far, has been taken out in sinking a shaft 40 feet, and in running a tunnel about 60 feet in length. The future of this property seems bright.

Mohawk and Frezeno. These claims, owned by Ramey and Downing, of Thomson's Landing, are under bond to J. H. Scott, of Nelson. They have a good surface showing of argentiferous galena, and in any country less difficult of access they would have been worked long ago.

Hunter & Trapper. These are very desirable properties, owned by the Canada Mutual Mining Development Company, of Toronto. They produce very high grade galena, but for some reason are not worked.

Carbonate Hill Group. This group consists of *Carbonate Hill*, *Silver Dollar*, *Iron Dollar*, and *Old Abe* mineral claims, owned by Joseph Best and John T. Moore, of Comaplix. A tunnel is being run on the *Carbonate Hill* to tap the vein at considerable depth, and if the surface indications are any criterion this tunnel should strike ore.

The *Black Bear* mineral claim is owned by T. V. Downing, of Thomson's Landing. On this property a strong lead, developed by a series of open cuts, shows galena, and can be traced the full length of the claim.

On the *Mountain Boy* mineral claim a tunnel has been driven in a distance of 90 feet by W. G. Girard, the owner, and he states that the tunnel will have to go about 25 feet further to cut the vein. On the outcrop above the tunnel, the vein shows, carrying a good grade of argentiferous galena.

There are quite a number of other mineral claims on Pool Creek, which have fair surface showings, but little is known regarding them, as their owners do barely sufficient work to hold them from year to year. The creek is staked from end to end, so much so that it is a very difficult matter to find a piece of vacant ground.

LEXINGTON CREEK.

Five miles north of Pool Creek we come to Lexington Creek, on which are many good claims. The ore seems to be in larger bodies, but of lower grade in silver than that of Pool Creek. The formation seems to be different, for while on Pool Creek are found black, glossy argillites, on Lexington Creek it consists of limestone and grayish shales.

Royal Group. Consisting of the *Lardeau King*, *Lardeau Queen*, and *Lardeau Prince* mineral claims. This property now belongs to a company, organised in Rossland, which is developing the properties, with very gratifying results. The ore is rather low grade, but is in great quantity, occurring in two parallel veins.

The *Wild Flower Group* consists of the *Blue Bell*, *Daisy*, and *Daffodil* mineral claims. The conditions are exactly similar to that of the *Royal Group*—low grade galena, but abundance of it.

BOYD CREEK.

Boyd Creek is some six miles north of Lexington Creek. Here we find the granite coming in, which formation has been prospected by different parties, but so far with poor success, only a little galena and molybdenite in small stringers having been found. In the formations which flank the granite, however, a number of good locations, have been made, notably in the lime dykes.

On one of these lime dykes we find the *Kootenay Chief*. This property *Kootenay Chief*. and others adjoining it belong to Mr. A. T. R. Blackwood, of Winnipeg.

A tunnel has been driven in some 50 feet, and several tons of high grade galena and gray copper ore extracted.

On the *Winnipeg*, another property belonging to Mr. Blackwood, a tunnel was run this summer for some 30 feet, exposing high grade galena and gray copper, 12 inches in width in places, the average being about 8 inches.

McDOUGALL CREEK.

On the other side of Fish River, and about four miles further north, we come to McDougall Creek. On this creek the ore is altogether different from that found on the others, resembling the Rossland ore, being chiefly pyrrhotite of rather low grade; being at such a distance from transportation, nothing, apparently, can be done with it at present. There are eight claims, showing this kind of ore, staked on McDougall Creek.

SABLE CREEK.

This district is about 12 miles from Comaplix, and contains a few good claims. Mention might be made of the *Agnes*, *Lucky Jack*, *Silver Star*, and *Jubilee*. These claims assay well in gold, besides silver and copper, but very little development work has been done on any of them.

On the divide between Sable and Isaac Creeks some good claims are located, notably the *Trilby Group*, on which, it was stated to me by one of the owners, there is 18 inches of solid galena. The claim is very difficult of access, however, there being no trail.

OFFICE STATISTICS—LARDEAU DIVISION.

(From November 1st, 1898, to October 31st, 1899.)

Crown grants issued	2
Number of claims recorded (locations)	280
Transfers, options, etc	107
Certificates of work issued	171
Free miners' certificates issued	113

TROUT LAKE MINING DIVISION.

REPORT BY THOS. TAYLOR, MINING RECORDER.

I have the honour to forward you herewith my annual report of the progress of the mining industry in this Division during the past year. While the progress has not been as general as was expected at the time of my last report, still a considerable advancement has been made, especially in regard to the developing properties, notwithstanding several serious drawbacks.

The season was very late in opening up, it being late midsummer before the snow left the higher ranges; then came incessant rains for fully two months, retarding to a great extent outside work.

The railroad question is still in abeyance, and although very active preparations were being made in the early spring towards pushing the railroads through to Trout Lake, the work

was finally dropped, after 14 miles on the Kootenay Lake end of the road had been almost completed. The fact that the work was not pushed more actively, and ultimately was abandoned altogether, had a very depressing effect. We are now, however, quite sanguine of the completion of one of the railroads, at least, during the coming summer, and until such time the camp must remain practically tied up, as far as ore shipments are concerned, as the present transportation rates are so excessive that only a few of the higher grade properties can ship at a profit.

Of the properties that have been developed to any extent, the *Silver Cup* ranks easily in the first place, especially when we consider that all shipments up to date have been made only from such ore as was taken out during the course of actual development, no effort having been made towards stoping. With the transportation question satisfactorily settled, and the installation of modern mining machinery, we may readily believe that the output will increase.

Other properties, such as the *Nettie L.*, *Silver Queen*, *Silver Belt*, *Badshot*, and others, are fast developing into mines; from the first of these a carload shipment gave the very handsome return of \$400 per ton.

The *Silver Cup Group* of mineral claims is situated on Silver Cup Creek, a tributary of Lardeau Creek, about 11 miles from Trout Lake by waggon road and pack trail, and consists of four full-sized claims, viz:—
Silver Cup, *Sunshine*, *Excelsior* and *Mountain*, and five fractional claims.

During the year ending the 30th November, 1899, some 1,300 feet of tunnels, winzes and raises were driven on this property, mainly on the *Silver Cup*, while about 150 tons of ore were sacked and made ready for shipment—about half coming from the *Silver Cup* and half from the *Sunshine* claim. With the exception of a little stoping at the latter claim, the ore has been obtained in the ordinary course of development, no effort having been made to take out ore, the policy in view being to bring the property to such a state of development as will justify the management in installing a plant capable of dealing with the output in the most economical manner. This stage should soon be reached, as at the present time a very large amount of ore, both of a high grade and concentrating character, has been opened up; besides which, a large tonnage of concentrating ore, of a value of about \$27 per ton, is on the dump ready for treatment. Apart from the 150 tons already mentioned, there has been shipped during the year, of ore previously sacked, about 170 tons. The total ore obtained to date from the property is about 820 tons, the gross value of which, according to smelter returns, has been about \$121,000, say \$148 to the ton.

The above-mentioned 1,300 feet of development have been mainly in the nature of dead work, consisting, to a large extent, of cross-cuts driven to tap the ore bodies at depth. This has been successfully accomplished, both at the *Silver Cup* and *Sunshine* claims, the total depth reached at the former being nearly 350 feet, and at the latter 175 feet. The 150 tons of ore sacked this year is estimated to be of the same grade as that previously shipped.

The property is owned by the Sunshine Limited, an English Company with Provincial offices in Revelstoke, under the management of E. A. Bennett, Esq., to whose very careful management and capable business methods are largely due the successful termination of the primary development work prior to the installation of machinery. A force of 40 men is now working on this property.

The *Towser* mineral claim, adjoining the *Sunshine*, has recently passed into the hands of J. M. Skeaff, representing Chicago capital. The necessary outbuildings and camps were erected and all outside work completed by October 15th, since which time a force of 12 men has been engaged in cross-cutting for the

ledge, which, it is expected, will be struck at a distance of 175 feet. Of this work 145 feet is now completed. The ledge has been ground-sluiced and stripped at a considerable distance below the present cross-cut, and a strong vein of high grade gray copper and galena ore has been exposed, of very similar nature to that found at the *Silver Cup*.

The *Nettie L.* mineral claim is situated between the North and South Forks of Lardeau Creek, about $1\frac{1}{2}$ miles from the town of Ferguson, with which it is connected by a good pack trail. A sleigh road has also been partially built to connect the mine with the present trunk road near Ferguson, and, when completed, will aid very materially in reducing the cost of handling the ores. The property is owned by the Great Western Mines, Ltd., a local company, with offices in Revelstoke. The development work is in the charge of W. D. Pool, who is working at present a force of about 25 men. A 160-foot cross-cut was completed in the early part of the year, tapping the ledge at a depth of 100 feet, and encountering a body of about 18 inches of galena and gray copper, with some carbonates. A drift was then run to the north, and is now in some 70 feet, while another drift was run some 50 feet to the south, both on the ledge and following a body of ore varying from 6 to 18 inches in width. A winze has also been sunk at a point near the junction of the cross-cut and drifts to a depth of about 35 feet, in which a 10-inch vein of ore is now being followed. Stopping in the north drift is now under way. During the course of development about 150 tons of ore was taken out and sacked; this is now being rawhided down the mountain. It is the intention of the management to make a shipment of 500 tons during the coming winter.

A cross-cut to tap the ledge at depth has been under way for some months, and is now in a distance of 500 feet; it is expected that the ledge will be encountered within the next 50 feet. A earload shipment was made to the Trail Smelter during the early spring, which gave a gross value of \$400 (in all values) per ton. A substantial ore-house has been erected; also more commodious quarters for employees.

The *Ajax* mineral claim, adjoining the *Nettie L.* on the south, has recently passed into the hands of the same company.

Maybee Mineral Claim Adjoins the *Nettie L.* on the north. A cross-cut is being pushed ahead to tap the ledge at a depth of 300 feet, and is now in 300 feet, but the ore body is not expected to be met with for some distance yet.

Other properties on the same ledge are the *I. X. L. Group*, on which a cross-cut is in some 60 or 70 feet, and the *Bran* and *Raven* mineral claims; a cross-cut of 80 feet on the latter is just nearing the ledge.

The *Glasscap Group*, in this vicinity, is under the control of a Toronto Syndicate, which has just completed a survey in order to obtain a Crown grant. This property has not been developed to any depth, but an arrangement is now being completed towards this end.

This claim, on Great Northern Mountain, has been acquired by Mr. A. St. G. Hamersley, of Vancouver, representing an English Syndicate. An old cross-cut, which had been driven during previous years 190 feet, was continued a total distance of 280 feet, cutting through, 1st, about 2 feet of zinc ore; then about 10 feet of concentrating ore, consisting of galena, in a quartz gangue; then some 12 inches of iron ore, and, finally, 18 inches of solid steel galena. Drifts have been run on the ledge, to the right and left of the cross-cut, for about 30 and 25 feet, following the vein of steel galena. Work on these drifts is still continuing, and a contract has just been let which will require the greater part of the winter to complete. A rawhide trail is being built from the mine to the trunk road on the North Fork.

St. Elmo and *Yankee* mineral claims adjoin the *Silver Queen*. A cross-cut tunnel, 125 feet below the upper workings, is now in some 40 or 50 feet, and a small force of men is at work. A shipment of ore from the upper workings was made to the Hall Mines Smelter, and netted \$85.18 per ton in all values.

Of the balance of the many promising claims in this vicinity, none have been doing any active development since my last report. Many promising locations have been made in this neighbourhood during the past season which have good surface showings, and may possibly become of importance.

NORTH FORK OF LARDEAU CREEK.

The Commonwealth Mining and Development Company, which owns *Glenside* and *Vera* these properties, has not followed up the development as was expected. **Groups.** The only work done on the groups during the past year was in making surveys. Crown grants are being applied for.

Surprise Group. On the *Surprise Group* of mineral claims, on the Horne ledge, the ledge has been cross-cut at a depth of some 50 feet, cutting a 10-inch vein of solid galena and about 3 feet of concentrating ore. The walls are very regular at this depth, and are of lime and slate. The ledge has been stripped on the surface at several points, and has a very heavy iron capping, which carries small gold values.

Rob Roy and Highland Chief Groups. The *Rob Roy* and *Highland Chief Groups*, also on the Horne ledge, have recently been acquired by the Scottish Canadian Mining and Development Company, of London, Ontario. The claims have been surveyed and Crown grants applied for. The main ledge is about 12 feet wide, with a heavy iron capping, and lies in a contact of lime and slate. Two smaller leads are found running parallel with the main ledge, distant from one another about 50 feet, and carrying small veins of galena. A 200-foot cross-cut, which will tap all three ledges, is being extended under contract, and is now in about 70 feet. The Company has also built about two miles of good trail, connecting with the Trunk Government Trail, and commodious quarters for the men have been erected.

The *Black Warrior Group*, at the head of Surprise Creek, has a cross-cut in about 180 feet. The lead is not expected to be cut until some 200 feet have been run.

The *I. X. L.* and *Ellsmere Groups*, on the Blackburn ledge, have a very large surface exposure of concentrating ore, from which some good values in gold have been obtained. No development at depth has yet been undertaken.

THE DUNCAN SLOPE.

Glengary Group. The *Glengary Group* of four claims, at the head of McDonald Creek, is among the oldest locations in the District. Owing to its distance from communication, however, very little work has been done upon it. The owners have now a good trail up Fish and Boyd Creeks, connecting the claims with the North-east Arm of Arrow Lake. The ledge is a very strong one, and is stripped in several places, exposing a vein of 28 inches of galena in a quartz ledge about 15 feet wide. A cross-cut taps the ledge at a depth of about 40 feet, and a drift, which is now in about 25 feet, is being run on the ledge. A winze is also being sunk, at the end of the drift, in 12 inches of galena and about 12 inches of carbonates. A diamond drill has been operated on the claims for some time past, but I have not been able to find out what the result has been.

The *Little Robert* and *Flathead Groups*, which gave promise of good results on development, have had very little more done on them than the necessary assessment work.

The *Silver Queen* and *Silver King* mineral claims, on the West Fork of Duncan River, are the property of the Old Gold Quartz and Placer Mining Company, Ltd., of Rossland. The development work for the past year consists of surface prospecting and the driving of two tunnels, aggregating in underground work about 400 feet. No. 1 tunnel, now in nearly 200 feet, is meant to tap the ledge at a depth of about 300 feet. No. 2 tunnel is in over 100 feet, and is being driven alongside of the lead, the ledge being cross-cut at intervals of 50 feet. No. 1 cross-cut from this tunnel has cut through about 3 feet of concentrating ore, with bunches of clean ore here and there. No. 2 cross-cut has about 3 feet of concentrating ore and about 8 inches of grey copper ore on the foot-wall. Two small test shipments have been made, one to the Tacoma Smelter and the other to the C. P. R. Smelter at Trail. The former gave returns of \$128, the latter \$132.20 (in all values), per ton. Suitable buildings for the accommodation of the eight men employed have been erected. Three miles of pack trail have also been built, connecting with the main trunk trail.

The *Grace C.* and *Edna* mineral claims are also on the West Fork of Duncan River, and are owned by the Primrose Gold Mining Co., the offices of which are in Rossland. This property has over 300 feet of underground work done. No. 1 cross-cut, driven to tap the lead at 300 feet depth, is now being pushed ahead as quickly as possible. The other work consists of a drive on the lead, the face being now in a white quartz, impregnated with galena and with a 6-inch vein of gray copper on the hanging wall. The winter operations are proceeding under contract.

The *Silver Leaf Group* of three claims on the Little West Fork of Duncan River is operated by the Guinea Gold Mines of B. C., with offices in Rossland. The Company began development during midsummer of this year, and the present indications are very favourable. Three small cross-cuts have been made near the surface, cutting the ledge, which carries several small veins of galena and 36 inches of concentrating ore. A cross-cut is being pushed in to tap the ledge at 150 feet depth. A small trial shipment, taken from surface cross-cuttings, gave returns of \$80 per ton.

The *Clara G. Group* of four claims in this vicinity is owned by the Duncan River Co-operative Mining Co. of Rossland. The property is now being developed by a 200-foot cross-cut, which has not yet reached the ledge. The surface showing is galena and concentrating ore, and the ledge is well-defined. Quarters have been erected for the men, and a couple of miles of trail built.

The *Maggie M.*, *Independence*, and *Peterson* mineral claims have recently changed hands, the Lardo-Duncan Gold and Silver Mining Co. of New Westminster being the present owner. The work so far has been altogether surface prospecting, and the result is evidently satisfactory, as the Company is preparing to begin development work on a large scale.

The *Susie*, *Lillian*, and *Nora Groups*, on the West Fork of Duncan River, have just been purchased by the Imperial Gold Mining Co. of Brandon, Man. The surface has been prospected by stripping in several places, but no depth has yet been attained.

The *Lade Group* of six claims is situated near the head of Gainer Creek, and is, so far as known, the only free gold property in this Division. The free gold is readily seen with the naked eye, and is found in small stringers or veins cutting diagonally across the formation. Very little development has been done beyond the annual assessment.

The *Abbott Group* of five claims, near the head of Healy Creek, has had very little development work done since my last report beyond stripping and cross-cutting the outcropping in several places on the *Union* claim, one of the group, where large bodies of concentrating ore were met with.

The *Empire Group*, at the head of Cariboo Creek, is operated by the Empire Group. Empire Mines of B. C. After doing a little surface work on the claims, the Company built 7 miles of trail, connecting with Gainer Creek Trail, and this occupied some months' time. A contract was then let for a 200-foot cross-cut to prove the vein at that depth, but a heavy snowstorm coming on prevented sufficient supplies being brought in to carry through the work, which was consequently abandoned until the opening up of next season. The group of five claims has been surveyed and Crown grants applied for.

The *Bannockburn Group* of five claims was purchased in the early spring by a Kaslo syndicate. A force of men has been at work for some months past on this group, but the result of the development work is not yet known here. The surface indications were considered very encouraging, probably the largest surface showings in the Division being found on these properties. Surveys have just been completed.

SOUTH FORK OF LARDEAU CREEK.

Consisting of five claims, is situated at the head of Gainer Creek, a tributary of the South Fork of Lardeau. The work has all been done on the *Badshot*, at a depth of 120 feet, to which point a shaft had been sunk during last year. The extension of the drifts from the bottom of this shaft to right and left has been in progress for some months. The ore is found lying in a contact between lime and slate, and is very high grade. The pay streak is said to average about six inches in width, and is high grade in silver and lead. Surveys of the group have just been completed and Crown grants applied for.

The *Molly Mack Group* of 12 adjoining claims on Gainer Creek has a very large surface showing, the outcrop of the ledge occurring at short intervals for upwards of three miles. Owing to development not having reached any depth, little is known beyond the surface indications, which show large bodies of low grade galena ore carrying almost the maximum percentage of lead.

The Gainer Creek section of the country has probably been more thoroughly prospected than any other in the camp, and location stakes are everywhere in evidence—in fact, I fear, in many places several deep; but, although surface indications are exceptionally favourable, as a rule the majority of the prospects are only superficially developed.

Consists of three claims situated on Brown's Creek, a tributary to the South Fork of Lardeau Creek, and is giving good promise of rapidly developing into a mine. On the *Silver Belt* claim the work consists of a 55-foot shaft sunk on a large stringer or feeder of the main ledge. A tunnel was run from the surface, tapping the bottom of the shaft and continuing a distance of 200 feet, when the main ledge was cross-cut. The ledge is well-defined, lying in a contact between lime and slate. Galena is found all through the vein matter, which will concentrate well. Fifty or sixty feet of a drift will come beneath the large surface showing that lies to the south-east of the shaft. During the work in the shaft some samples of exceptionally high grade ore were met with, which are said to have assayed over \$500 per ton. Several small shipments have been made to smelters.

Consists of seven claims, situated near Seven-mile Creek, on the South Fork. On the *Jumbo* mineral claim, one of the group, a cross-cut has been run for 75 feet, and the ledge, about 6 feet wide, cut through. Drifting on the ledge has been carried on for a short distance, following along a small vein of galena, the rest of the ledge being composed of iron sulphides, carrying small gold values, and quartz, with a considerable amount of galena sprinkled through it.

The *Old Reliable* and *Sharon* claims, near the Silver Cup Group, have recently been purchased by a local syndicate, which is driving a cross-cut, now in some 60 feet. As the ledge is not expected to be reached for some distance, nothing is known of this group beyond the surface indications, where a large, well-defined ledge about 3 feet wide, carrying mostly concentrating ore, has been stripped in several places.

This group of 3 claims on Glacier Creek, about $3\frac{1}{2}$ miles from Trout Lake, has been developed during the last year by about 250 feet of underground work, consisting principally of drifting on the ledge. A force of four men is now working the property on a six months' lease from the owners. The work is being carried on in the winze in No. 1 Drift, with very good results. Several small shipments have been made, netting about \$70 per ton, principally in silver values.

On this group of four claims, also on Glacier Creek and adjoining the Homestske Group. *Ethel Group*, drifting has been continued on the ledge, from a 65-foot cross-cut driven last year, for a distance of over 70 feet. The result of this work has been to give a decidedly better appearance to this property, as the vein is improving both in size and quality. In the face of the south drift is exposed a 4-inch vein of galena and 4 inches of carbonates, the remainder being a gray quartz.

Consisting of five claims, is situated on Five-mile Creek, a tributary of Silver Bell Group, Trout Lake, and is being operated by J. S. Lawson, representing the Cumberland Mining Co. A winter contract has been let for a 200-foot cross-cut to tap the ledge, and this is now in about 75 feet.

Copper Chief Group, Situated on Trout Creek, has a very strong ledge with a heavy iron capping. Very little work has been done. A shaft has been sunk about 20 feet on the ledge. The ore gives good values in copper and gold.

The *Copper King Group*, on the summit of the divide, about three miles east of Trout Lake, has a shaft sunk for 34 feet on the ledge, and this is in concentrating galena ore.

This group of five claims on Eight-mile Creek has been developed by a shaft sunk on the ledge on the *Virginia Claim*. The shaft is down some 45 feet, and in the bottom a 6-inch vein of galena and 4 inches of carbonates are exposed. The ledge has been exposed by stripping for 300 feet, but is mostly concentrating ore on the surface. Drifting has also been continued on the *Mabel* for some distance. The ledge matter is composed mostly of concentrating ore. The *Lucky Jim*, adjoining the Virginia, has a good surface showing.

Continuing along this ledge are found the *I.X.L.*, *Silver Cord*, *Silver Plate*, and several other locations, undeveloped, but with good surface showings.

The *J. C. Group*, at the head of Lake Creek, is giving good results for the amount of work done. The ledge is cross-cut at a depth of about 60 feet, and is about 8 feet wide.

Several promising-looking locations have been made in this vicinity during the past season, among which may be mentioned the *Snowshoe Group*, the *Rusty Axe*, and *Silverton Bay*, the former two carrying exceptionally high values in copper.

The *Glacier Gertrude* and *Glacier* mineral claims, near the head of Lake Creek, are owned by the Gold Hills Exploration and Development Co. A large force of men has been at work on these properties for some months, and is meeting with good success.

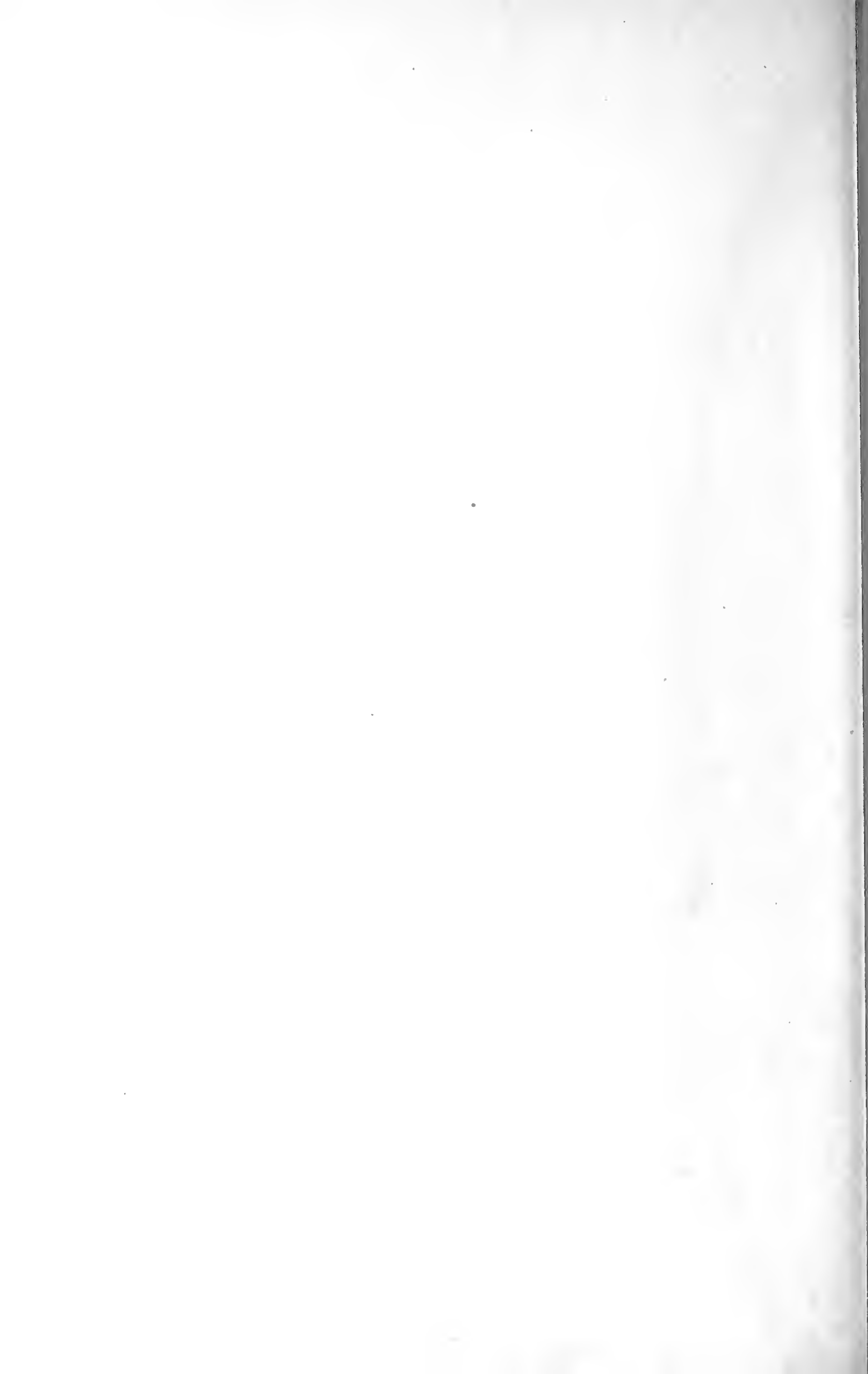
The *Silver Cable Group* of three claims on Tenderfoot Creek is a recent location, but should develop well, judging from surface appearances. The ledge is a strong one, and outcrops in several places. The ore on the surface, taken from an 8-inch vein, gave assay values of \$91 in silver per ton.



VIEW FROM KASLO—AINSWORTH M. D.



WHITEWATER CONCENTRATOR—AINSWORTH M. D.



The *John L. Group* of six claims on Tenderfoot Creek has recently been bonded to a Spokane company, as also has the *Pedro Group* of ten claims at the head of Canyon Creek. The former group is a new find, while the latter has very little work done. Both properties have good surface showings.

OFFICE STATISTICS—TROUT LAKE DIVISION.

Free miners' certificates issued	266
Certificates of improvements issued	19
Mineral claims recorded	379
Placer "	1
Certificates of work recorded	485
Bills of sale, agreements, etc., recorded	286

SLOCAN DISTRICT.

SLOCAN MINING DIVISION.

REPORT BY ANGUS McINNES, MINING RECORDER.

I have the honour to submit herewith my annual report giving the statistics of the Mining Recorder's Office of the Slocan Mining Division at New Denver for the year 1899, as instructed in your letter of 21st ultimo. I also enclose information required regarding mining properties working in the said Division, so far as I have been able to procure the same. In compliance with the instructions contained in your letter, I have endeavoured to make this report as complete as possible without incurring any additional expense, and in order to procure the information I sent to the manager of each property a blank similar to one enclosed, requesting that it be filled out and returned to me.

The managers of the following mines have not so far complied with my request, viz. :—*Payne, Last Chance, Ajax, Treasure Vault, Red Fox, Trade Dollar, Noble V, Idaho, Jackson, Dardanelles, Wakefield, and Comstock.* I regret that I am, therefore, unable to give reliable information regarding these properties, without incurring additional expense.

OFFICE STATISTICS—SLOCAN MINING DIVISION.

Number of locations recorded during year	393
" placer claims recorded during year	<i>Nil.</i>
" certificates of work recorded during year	778
Amount of cash paid in lieu of work	\$3,000
Number of certificates of improvement recorded	80
" instruments recorded in "Record of Conveyances"	507
" abandonments recorded	12
" water right permits issued	9
" free miners' certificates issued to individuals	868
" " " " companies	31
" special free miners' certificates issued to individuals	7
" " " " companies	<i>Nil.</i>

SLOCAN CITY MINING DIVISION.

REPORTED BY H. P. CHRISTIE—MINING RECORDER.

I have the honour to submit to you my report of the mining developments, etc., in my Division during the past year.

There has been more activity displayed in this Division during the past year than has been heretofore. The properties that have been doing more than the ordinary assessment work are the following: *Arlington, Black Prince, Skylark and Ranger, Chapleau, Enterprise, Kilo, Two Friends, Bank of England, Calumet and Hecla, Rainbow, Tamarac, Evening Star, Alexandria, St. Louis, Black Hussar* and the *Hamilton Group*. The following is a more detailed account of the work done.

SPRINGER CREEK.

Arlington. Fifteen to twenty men have been actively engaged since the early summer under W. F. Dubois, in developing the mine. No ore has yet been shipped. The force of men is to be increased shortly.

Two Friends has been worked on a small scale during the summer. Two or three men were employed developing.

Black Prince. Five or six men were at work continuously during the past year developing the property. Two car loads of ore have been shipped and two more are ready to ship.

Rainbow. At present three men are at work developing.

Tamarac. Four or five men working during the summer. One car load of ore shipped.

Calumet and Hecla. A cross-cut of 160 feet has been driven to tap the ledge, on which 150 feet of drifting has been done. Work is still being prosecuted with a few men.

Evening Star. Twelve men were at work all the summer developing, but at present the mine is shut down owing to labour trouble. No ore was shipped.

LEMON CREEK—FIRST NORTH FORK.

Barnett Group has been Crown-granted and a small amount of work done.

Alexandria. Three or four men were working all summer developing.

White Sparrow. A cross-cut of 150 feet has been driven and considerable drifting done.

Kilo Group, consisting of 22 claims, owned by the Warner-Miller Syndicate and operated and managed by Percy Dickenson, who has been working about fifteen men for the last three months. The property is being opened up by driving tunnels on the ledge and very encouraging results have been obtained. The character of the ore is quartz carrying iron pyrites, values being in gold.

Chapleau. This property has been bonded by J. M. Williams for \$30,000 of which \$10,000 has been paid. About fifteen men at present are at work developing and buildings have been erected with a view to largely increasing this force. The work completed so far consists of two incline shafts down about 65 and 95 feet respectively, and a drift tunnel of 130 feet, from which they are sinking a shaft, now down 40 feet. The character of the ore is quartz with auriferous iron pyrites and silver sulphides. Five car loads have been shipped, carrying heavy gold values.

Skylark and Ranger. These two claims are again under bond and are managed by Mr. Percy Dickenson. About twelve men have been working since July and buildings have just been completed with a view to largely increasing this force. The mine is being developed by drift tunnels. No. 1 is in about 140 feet; No. 2 about 250 feet and No. 3 about 80 feet. The

character of the ore is quartz with silver sulphides and gold values. This is one of the most persistent ledges in the District, having been traced for over two full claims. Very good results have been met with in development. No ore shipped.

Black Hussar. Two or three men have been developing during the summer. A good strike of argentiferous galena was made. No ore shipped.

Louisa Fraction and Rose Group. A little work has been done developing which proved very satisfactory. This property adjoins the *Kilo Group*. The character of the ore is quartz with gold values only.

Legal, adjoining *Louisa Fraction*, was worked a little and has a promising showing.

There are numbers of smaller properties on this creek, the results on which, for the small amount of development done, have been most satisfactory and no doubt this camp will be a busy one in the future.

LEMON CREEK—SECOND NORTH FORK.

On this creek numbers of prospects have been located but little work done.

St. Louis has been worked with a small force of men all summer.

On the various South Forks of Lemon Creek and on the main creek itself there has been little done outside of ordinary assessment, although there are numbers of promising ledges.

TEN-MILE CREEK.

Although there are a number of valuable properties on this creek nothing of importance has been done. Even the *Enterprise Mine* has been practically idle since June, but this is owing to the friction between capital and labour.

Twelve-Mile Creek is much the same as Ten-Mile, numbers of prospects with but little work done.

OFFICE STATISTICS—SLOCAN CITY MINING DIVISION.

Certificates of work issued	515
Certificates of Improvements (Crown Grants).	19
Locations recorded	310
Free Miners' Certificates issued	301
Bills of Sale, etc., recorded	220

NELSON DISTRICT.

NELSON MINING DIVISION.

The usual report on the Nelson Division is lacking this year, owing to the absence of the Gold Commissioner of the District, and the fact of there having been a change of Mining Recorders late in the Fall.

During the early part of the season there was a very considerable amount of mining activity around Ymir, but during the latter part of the year this District was much disturbed by the so called "labour troubles."

The property of this Company is situated on Morning Mountain, near Athabasca Gold Mines, Ltd. Nelson, and is under the management of E. Nelson Fell, of Nelson. During the season some 80 men were employed below ground and some 40 above. About 5,400 tons of ore were mined and milled at the Company's 10-stamp mill, yielding about \$105,000, or a recovery of about \$20 per ton. The following is taken from the Annual Report of the Company. During the year some 1,275 feet of development work was done. Some 40,000 tons of ore and waste have been handled at a total cost of \$74,824.35 or about \$1.87 per ton of material, or on the actual ore mined at a cost of about \$14 per ton. The cost of teaming to the mill was 23½ cents per ton. The profits for the year are stated to be \$31,504.55, which is exceedingly creditable for the first year of the Company's control of the property, especially as the mining was all hand work and labour was scarce.

The *Blackcock*, in the Ymir District, has been employing 8 or 10 men all the season, chiefly on development work, but has managed to make a small shipment of some 35 to 40 tons which contained about \$25 per ton value in gold and silver. The property is in charge of A. Julien, Managing Director.

The Dundee Gold Mining Company, Limited, of Ymir—President, Charles Dundee, Rossland—employed from 10 to 20 men, also chiefly on development work, treating only about 200 tons.

The *Exchequer Mine*, Nelson, employed some 6 men, shipping 50 tons of \$20 ore.

The *Fern Mine*, Nelson, employed 25 men, treating some 300 tons of ore.

The *Granite Mine*, Nelson, has been doing extensive preparatory work, employing 45 men under-ground and 35 men above-ground.

The value of the plant now installed is about \$65,000.

Ore treatment only began in the last of the season, but over 800 tons of ore were treated averaging better than \$10 per ton.

The *Poorman* employed some 38 men for the first three months of the year, but made no shipments.

The *Hall Mines, Limited*, on Toad Mountain, H. E. Croasdaile, Manager, Nelson, mined and treated over 30,000 tons of ore, running over 15 oz. in silver and 2¼ % copper.

The *Mollie Gibson Mine*, situated at the head of Kokanee Creek, Bruce White, Manager, has been developed, employing 8 men under-ground and 12 above. A waggon road has been

built from Kootenay Arm to the mine and was only completed in the Fall. The ore contains about 150 oz. silver and 25 % lead. Less than 40 tons were treated this past year as the plant was only in course of construction.

The *Porto Rico*, situated at the head of Barret Creek, was in charge of S. L. Long, and shipped during the year over 4,000 tons of ore, valued at about \$70,000.

The *Ymir Mine*, on Salmon River, J. Roderick Robertson, General Manager, employed some 19 men under-ground and some 44 above, including those on construction. Over 17,000 tons of ore were treated, valued at about \$10 per ton.

The *Yellowstone*, at the junction of Sheep and Wolf Creeks, H. E. Haultain, Manager, Salmo, B. C., employed from 10 to 30 men below ground and from 25 to 100 above ground, but made no shipments.

OFFICE STATISTICS—NELSON DIVISION FOR YEAR 1899.

Number of Claims recorded (mineral)	978
" (placer)	<i>Nil</i>
Certificates of work issued	1,869
Money paid in lieu of assessment work	29
Certificates of Improvements recorded	107
Bills of Sale and Transfers recorded	689
Abandonments recorded	12
Substituted Certificates issued	2
Free Miners' Certificates issued	1,428
Special Free Miners' Certificates issued	24
Company "	37
	— 1,489

GOAT RIVER MINING DIVISION.

REPORT BY E. MURPHY, MINING RECORDER.

I have the honour to forward herewith report on Goat River Mining Division, and of the work which passed through this office from the 16th day of June to the 31st day of December, 1899.

With probably a half a dozen exceptions, very little development work has been done this season beyond the necessary annual assessment work.

MIDGE CREEK.

On this creek, which empties into Kootenay Lake about twelve miles from the southern end, the most extensive work in the Division has been done.

The majority of the claims are situated near the head of the creek, at a distance of twelve miles from Kootenay Lake.

The ore is chiefly galena, carrying gold and a little copper.

WHITE GROUSE CAMP.

During the past season a trail, commencing at Kitchener, on the line of the Canadian Pacific Railroad, was built into this camp, rising on an easy grade. Nothing more than the annual assessment work has been done.

With improved transportation facilities this camp would be a shipper, as there are undoubtedly a number of large ore bodies indicated by work already done.

Within the past few months capital has acquired some of the best known claims, and in all likelihood during the coming season much development work will be performed. The ore is high grade galena, with grey copper and copper pyrites.

GOAT CREEK.

This creek empties into Kootenay Lake on the east side, nearly opposite Midge Creek. The assessment work has been recorded on nearly 80 % of the previous year's locations, and quite a few new locations have been made. A good trail extends six miles to the head of the creek, where are situated some very valuable free-milling claims.

SUMMIT CREEK

Flows into the Kootenay River about four miles south of the Kootenay Lake. On this creek a great many new locations have been made, and very few of the old locations have been allowed to lapse. The character of the ore is principally grey copper and galena. A trail extends from the Kootenay River over the summit to Lost Creek, on the Salmon River slope.

ARROW CREEK,

On the divide between Arrow Creek and Goat River, quite a number of locations have been made, upon which active development work is being carried on at the present time, with very favourable results.

The principal claims are located on a monster iron capping, carrying gold and copper values.

DUCK CREEK.

The oldest claims in the district are in the vicinity of Duck Creek; among them are a number of very promising claims, carrying high values in copper and gold; there has been considerable development work done on some of these properties, and some shipments made in the past few years, but this season little more than the assessment work has been done on any.

OFFICE STATISTICS—GOAT RIVER DIVISION.

Mineral claims	recorded.....	316
Certificates of work	"	261
Payments in lieu of assessment.....		4
Free Miners' certificates issued.....		81
Special	"	2
Bills of Sale, Bonds, &c.....		105

AINSWORTH MINING DIVISION.

At intervals, as time could be spared from the collecting of the Mineral Exhibit for Paris, the Provincial Mineralogist, while in this District, made a number of short trips to various camps to inspect the recent mining development. These trips were greatly interfered with by rain, which fell almost continuously for about four or five weeks, making travel through the brush exceedingly difficult. No attempt was made to see all the properties in the District, but only those which have had recent development done on them, the whole District having already been reviewed in the Reports of this Department.

 HAMILL CREEK.

Hamill Creek flows into the Lower Duncan River from the east. The lower part of this creek is a "box canyon," through which it is not feasible to run a trail, it being quite impassable except on the ice in winter. A trail, starting from the town of Argenta, at the upper end of Kootenay Lake, crosses over a low summit and then descends into the valley of Hamill Creek, at a point some four or five miles from the mouth of the creek, and above the canyon referred to. This is a main trunk trail, which follows up Hamill Creek to the summit and crosses by Wells Pass onto the head waters of Toby Creek, in East Kootenay. During the past summer a great many prospectors took this road from West Kootenay over into the Windermere District.

This claim (owned by a Scotch syndicate, J. McKane, of Rossland, Lavenah Mineral agent) lies on the north slope of Hamill Creek, about five miles above the mouth, and is reached by a branch trail, which leaves the main trail at Joe Clinton's cabin, in the creek bottom, and ascends the hill for about $4\frac{1}{2}$ miles, in which distance an elevation above the cabin of 4,500 feet is gained, the total elevation of the property being 7,000 feet above the sea.

The country rock is composed of shales, quartzites and limestone, having a strike of about S.E., and a dip of 52° to N.E.

On this property a tunnel had been run in some 250 feet, on what appeared to be a fairly well-defined quartz vein, running to the S.W. up the hill and across the property, cutting the formation at right angles. At 200 feet within the tunnel a raise had been made for 70 feet, while further out two small drifts had been made, where it appeared as though there was an offshoot to the vein. The quartz in the tunnel carries galena in patches of considerable promise, though not as yet in sufficient quantity to be profitably mined.

A short distance above the tunnel there was exposed an interbedded vein, stripped for 100 feet or more, cutting the vein on which the tunnel was run, and of which it appeared to be an offshoot. For the whole length of this stripping, solid galena, varying in width from 9 to 12 inches, was exposed, but did not extend further than 100 feet in all. This vein dips with the measures towards the mouth of the tunnel at an angle of 52° , and, seemingly, if it continues with depth, should have been encountered in the tunnel; I could not see that it had been so encountered, however. There is enough ore in sight to render further development justifiable, but not enough as yet to cause the property to rank other than as a prospect.

This claim adjoins the *Lavenah*, and it is probable that the *Lavenah* vein cuts across this property as well, although no work has been done to prove this.

Following the line of the *Lavenah* vein up the hill to the summit as far as the *Midget* ground, and very near to what was supposed at that time to be the dividing line (for the properties had not then been surveyed), there is found a quartz vein cutting diagonally across the measures at an angle of 45° with the *Lavenah* vein. This vein has been exposed for from 50 to 75 feet on a steep bluff by a large open cut, or rather stripping, which shows the vein to be continuous for that distance, and also that it carries galena from 6 to 12 inches wide, not continuous, but still in considerable quantity.

No work further than a little stripping had been done, so that it is impossible to say what amount of mineral to expect on the property, which is a promising prospect.

There are a number of other claims, on this same slope, on which a little work had been done, Jos. Clinton having a couple from which copper values have been obtained.

On the south slope of the creek some few claims have been somewhat developed, and are said to have fair showings, but, as they were difficult of access and were not then working, I did not inspect them.

From the *Lavenah* trail, near the top, there is a switchback trail, **Grand Republic**, which leads over the summit into the basin of Glacier Creek. Following this trail, and about half-way down it, the *Grand Republic* mineral claim is reached at an elevation of 4,700 feet. This property is held by Hanson & Meyer.

Through this property a huge "lime dyke" runs with the shales, and, outcropping, forms a low bluff, extending for some distance.

Along the contact of this lime with the slates which underlay it there is evidence of mineralization. At the discovery post of the claim several small cuts and some surface stripping show, in the bluish limestone, small bodies of galena, but none of workable size have yet been proven.

Some little distance lower down, on the same contact, a tunnel had been driven into the dyke for 10 feet, but there was no ore visible on any of the walls.

DUNCAN RIVER SECTION.

The upper Duncan country, *i. e.*, the drainage area of the Duncan River above Howser Lake, has for several years back been considerably prospected, and a number of very promising finds are reported.

The upper reaches of the river are approached from Trout Lake, over an exceedingly difficult summit, possible for prospectors with their horses at certain seasons, but quite out of the question as a route for the transportation of ore.

Within the last two years prospectors have been going up the Duncan River from Kootenay Lake in boats, and then packing their supplies on their backs up the various creeks, where they have apparently been rewarded by some very promising finds.

The Duncan River is navigable for some distance up for steamers of very shallow draught, but until the channel is improved it is a troublesome trip; still it may serve for the transportation of supplies in and ore out.

There is, however, urgent need for a waggon road, or at least a good trunk trail up the river from the head of navigation, as this whole section is without any means of transportation, and the cost of doing any serious work is in consequence so great that few of the properties can claim, as yet, to be more than prospects, although a few have advanced to that stage where machinery is almost a necessity. It is reported that one or two properties are in a position to ship ore as soon as facilities are afforded them.

Most of the prospects have been found to carry galena, with good silver values.

The writer made an attempt to get up into this section in July last, coming over from Hamill Creek to Duncan City, or Howser as it is now called, for that purpose; but he found that all the prospectors were out in the field and the rush of work, consequent on the construction of the Duncan-Lardo Railway, left no men or boats available to make the trip.

Some three or four horses had been taken up the river in the winter to one of the creeks, and were being used for packing supplies part of the way up this creek, but elsewhere, the absence of horses, or even of trails on which they could travel, would have necessitated packing the camp outfit on men's backs, which would have been both exceedingly slow and expensive; consequently the trip was postponed until better facilities of travel shall be available, and the properties are brought within touch of the market.

Two railways from the northern end of Kootenay Lake, one on the east and the other on the west of the Duncan River, were in course of construction, a considerable amount of grading having been done as far as Duncan City, where both roads head off up the Lardo River towards Trout Lake.

The Lardo River section has been this year thoroughly prospected along the line of the railway in course of construction, and a number of claims are reported from this section as having considerable promise, and of which something should be heard during the present year (1900).

HOT SPRINGS CAMP.

The most important mining work going on in the old "Hot Springs Camp," or Ainsworth, is the *Highlander* tunnel, an exceedingly bold and costly attempt to open up at a depth of nearly 1,000 feet, by a tunnel 2,000 feet long, certain properties on the bluff behind Ainsworth.

This is a great depth at which to run a tunnel into unknown ground and is, in a way, rather risky, since, even in the event of no ore body being found in the tunnel, it is not conclusive that in the 1,000 feet above there may not be even a very large body of ore. On the other hand, if the ore bodies are found to continue down to the tunnel level, a magnificent future is open for the enterprise and a permanency will have been proved for the ore bodies of the camp, which will be of the greatest benefit both to the camp and the District. The result of the undertaking will therefore be anxiously waited for by the public, and its success will be honestly hoped for.

The following is a brief description of the work and of the properties directly affected by it. The figures are approximate, the distances being estimated on the ground and elevations taken from a pocket barometer. At a point on the West shore of Kootenay Lake, about a mile below Ainsworth Town, the bank rises abruptly from the water's edge for about 100 feet; thence by a series of small rises and terraces it reaches an elevation of some 600 feet above the lake, in a horizontal distance of from about 2,500 to 3,000 feet. At this point an almost precipitous rise (say 50°) of some 600 or 700 feet occurs, when another terrace, some 400 or 600 feet across, is reached, at a total elevation above the lake of about 1,300 feet. Here the ground again begins rising at an angle of almost 30° . On this last rise, at an elevation of some 1,500 feet above the lake, are located, on a continued set of leads, the *Little Donald*, *Black Diamond*, *Little Phil*, *Maestro* and other mineral claims.

The general character of the ore bodies on these claims is illustrated by the workings of the *Little Phil* and *Black Diamond*, which have been opened up by a common or joint tunnel, run in from what I shall call the 1,300 foot terrace. These workings show that of the three leads occurring on the surface, at an elevation of say 1,500 feet, one does not go down to the level of the 1,300 foot terrace, while the two others do, and continue below that level with fair values. How much below this level these ore bodies extend, has not been proved by any workings.

The *Highlander Claim* is also situated on the steep bluff just described.

Highlander. The workings on this mine only extend down a short distance; I have not exact data as to how far, but not over 200 feet.

All these leads mentioned dip to the west, viz., away from the lake, which implies that the tunnel driven to reach them will be longer in proportion to the depth attained.

The Highlander Mining and Milling Company, of Philadelphia, under the management of Maxwell Stevenson, with L. B. Luther as Superintendent of the tunnel, owns the *Little Donald*, *Black Diamond*, *Highlander*, *Eagle* (which lies just below the *Highlander*), and the *Ivanhoe* (which lies between the *Eagle* and the shore of the lake).

On the *Eagle*, at an elevation of 300 feet above the lake, the Company has started its tunnel which runs to the west to tap the claims mentioned, the *Eagle* itself being only used as a tunnel site. This tunnel will have to be run, approximately, 2,000 feet to do this, but it will cut the *Highlander* about 700 feet and the *Little Donald* and *Black Diamond* some 1,000 feet below any of the present workings.

The tunnel was well under way in July last, having penetrated for about 150 feet, and an exceedingly permanent class of work was being done. The size of the tunnel was 8 feet by 8 feet in the clear inside of the timbers. These latter consisted of 12 by 12 sawn timbers, lagged with 2 by 12 sawn plank, with an extra layer overhead. The lower 18 inches of the tunnel was floored over to allow of a waterway underneath.

Water was brought by a flume to the top of the high bench, the quantity being estimated at 60 miner's inches. It was thence conducted to the mill by a wrought iron pipe line some 2,200 feet long, and of decreasing diameter, first 6 inches, then 5 inches, and then 4 inches.

Here a 100 h. p. Guthrie water wheel was being installed to utilize the water, under a head of 1,060 feet, to drive the mill and an air compressor which will provide compressed air for use in the tunnel.

Mill. The Company's mill is located on the steep bank which almost overhangs the lake, and is connected by aerial tramway with the *Highlander Mine* ore bins on the bluff. These bins are connected by surface tram with the *Little Phil* workings, whence, in July last, the ore being treated in the mill was derived.

The mill is a very tidy and convenient little plant, the ore being delivered into elevated bins by the rope tramway. The plant consists of bins of 200 tons capacity, one 7 by 10 jaw crusher, 1 pair 12 by 30 rough rolls, 2 pair finishing rolls, set of 3 Trommel screens, 3 sets double 4-compartment jigs, 1 double decked Evans table, 2 Frue vanners, settling boxes, etc., and suitable concentrate bins, etc., below. Power was generated by a 12 by 24 Kreider horizontal engine supplied with steam from a 80 h. p. locomotive boiler.

Although Hot Springs Camp is one of the oldest in the Kootenays, there is still a considerable amount of prospecting going on, and new finds are constantly being reported, none of which, however, have as yet been sufficiently developed to prove their value. The only mines in the camp which are actually producing are the *Little Phil*, *Tariff*, and the *No. 1*.

This claim has been already mentioned. The property was worked
Little Phil. some years ago, and a large portion of the leads above the tunnel level were stoped out. The mine was opened up again under new management during the past summer, and a small force of men was employed getting it into repair and doing some stoping, there being quite a little ore yet left above the tunnel level, while below this level the ground is both untouched and unproved. The ore is clean galena, occurring interbedded between the slates or shales, and dipping to the west at about 60°. The ore was being trammed to the edge of the bluff, dumped into the ore bins of the *Highlander* mine, and taken thence by the wire tramway to the *Highlander* mill, already described. The concentrates run about 60 to 70 % lead, and about 60 oz. silver to the ton.

The *Tariff* is situated just to the south of the *Eagle* claim, on which
Tariff. the *Highlander* tunnel begins, and at an elevation above the lake of some 300 or 400 feet. It is one of the old style 600 by 1500 feet claims, and is owned by the Grant & Omaha Smelting Co., of St. Louis, Mo., but is under lease and bond to F. A. Heap, of Ainsworth. Some fifteen men were being employed at the time of my visit. On this claim there appears to be a zone of quartzose matter nearly 30 feet wide, interbedded

between schists, having a strike nearly north and south, and dipping to the west at 35° . In this zone there is a pay-streak about 4 feet wide, carrying galena. This streak, as mined, concentrates in the mill about 6 to 1, and about 90 per cent. of the value is said to be saved. The output of the mine is 20 tons of ore per day, the concentrating charge being \$1 per ton of ore, and the freight and treatment charge on the concentrates \$20 per ton. Assay values are approximately 60 % lead and 70 oz. silver to the ton. The ore is transported by a wire rope tramway for 2,000 feet to ore bins situated beside the *Highlander* Concentrator, and thence by lighter to the Woodberry Creek Concentrator. The underground workings consist of a shaft down 300 feet on the vein, with levels at 100 feet, 200 feet, and 300 feet. The 100-foot level extends 200 feet to the south and 100 feet to the north; the 200-foot, 75 feet to the south and 200 feet to the north; while the 300-foot level extends 150 feet to the north.

No. 1 Mine. This is a 600 by 1,500 feet Crown-granted claim, situated some two miles due west of the town of Ainsworth, at an elevation above sea level of some 4,300 feet. It is owned by the Britannia Mining Company, of Windsor, N. S., and is under the management of Mr. Leander Shaw. The Company is also interested in the *E. W. R., Aleyone, No. 1 Extension*, and other mineral claims in the immediate vicinity. The deposit is an irregular body, occurring in limestone, with a strike N. 40° E., and a dip to N.W. of 35° . It seems to be a replacement of the lime by mineral along a fracture. The ore consists of iron sulphides, carrying silver but no gold, in a calcareous gangue. There is a very fair but rather old concentrator on the property, where the ore is concentrated, the concentrates being sold to a smelter.

The underground workings consist of a 900-foot tunnel, from which an inclined shaft goes down on the vein for 283 feet.

Above the tunnel the workings extend to the surface, a vertical height of 140 feet, or on the incline about 275 feet.

The ore chute is from about 100 to 120 feet long, and has been pretty well stoped out as far as the present workings go.

The lower level was partly filled with water, which was being pumped out at the time of my visit, so that I could not examine the chute at the bottom.

The dynamite was stored underground, but a powder-house outside was to be provided. Some eight men were employed.

Silver Glance. This is a fractional Crown-granted claim of about 15 acres, situated on the bed of the South Fork of Woodberry Creek, $1\frac{1}{2}$ miles from the mouth, at an elevation of 2,800 feet. It is reached by trail from Ainsworth, and is owned by John S. Baker, of Tacoma.

The country rocks are mica schists with bands of limestone and having a strike N. and S., dipping to west.

The ore occurs in a quartz fissure vein, which cuts the formation.

The mineralization is slight, consisting of white and yellow iron sulphides and a little galena, with values in gold and silver.

The underground workings consist of a tunnel started from the creek level, and following the vein in a direction about S. 70° E. for 215 feet. Here the vein seems to split, and is followed by two branches of the tunnel, one going N. 85° E. for 75 feet, in which the vein appears to pinch out, the other branch extending for 60 feet S. 70° E. with the vein still in the face. Two men were employed.

The *Blue Bell* Mine, the first mine worked in the Kootenay country, **Blue Bell.** is situated on the east shore of Kootenay Lake, opposite Ainsworth. The property is not now being worked and, together with the Pilot Bay smelter, previously owned by the same people, has passed into the hands of Mr. Campbell Sweeney, of the Bank of Montreal, Vancouver. The old workings are extensive; the plant, consisting of a splendid air compressor, boilers, pumps, etc., is very complete and in good repair.

A large amount of ore has been taken out of the mine and a very large amount, which might almost be described as being "in sight," still remains. It consists of galena, zinc blende, and iron sulphides, occurring in huge masses and associated with white crystalline limestone. The ore carries only a few ounces of silver, said to be from 4 to 6 oz. per ton. This was found to be of too low a grade to be worked at a profit; but, I am told, there is some likelihood of the property being taken up by other parties who hope, by saving the zinc values, to be able to run it to advantage.

This is a 600 by 1,500-foot Crown-granted claim, situated on the east **Tam o' Shanter.** shore of Kootenay Lake, a mile or so north of the *Blue Bell*, and is owned by the Montreal and Kootenay Mining Company, of Montreal. The Manager is R. Irwin, of Ainsworth. From the water's edge a tunnel, 460 feet long and gaining some 200 feet in depth, follows in a 2-foot vein, sparsely mineralized on one side with iron and galena said to carry 30 oz. of silver per ton, while picked ore from a streak on the other side, still more sparsely mineralized with silver sulphides, etc., is said to give 40 oz. of silver to the ton. About three men were working on the property.

WOODBERRY CREEK.

The Canadian Pacific Mining and Milling Company, of Minneapolis, **Woodberry Creek** Minn., U. S. A., has built and is operating a concentrator on the West **Concentrator** shore of Kootenay Lake at the mouth of Woodberry Creek. The President **and Mines.** of the Company is Mr. Elias Fetterling; Secretary, A. H. Parker, 320 N. Y. Life Building, Minneapolis; General Manager, A. D. Westley.

Concentrator.—The concentrator plant, including both machinery and building, is worthy of note, as showing how cheaply a very efficient small concentrator can be built.

This is probably the most cheaply constructed plant of the sort in the Province, and while not notable for its finish, is very effective, and does the work required of it well and economically.

The capacity of the mill is somewhere about 50 tons per day. The plant consists of (besides bins, etc.) 1 jaw crusher, 3 sets of rolls, 3 four-compartment single jigs, 1 round table, 3 elevators, Trommels, etc., etc.

The cost of the plant was given me by Mr. Westley as having been \$6,500. It was made by W. C. Bryant, of Carterville, Missouri.

The power is obtained from water brought from Woodberry Creek in a 3½ by 4-foot flume, 1,200 feet long, and delivered under a head of 100 feet, by an iron penstock, to two Pelton wheels, one of which supplies power for the concentrator while the other is used to drive a No. 12 Ingersoll compressor, from which air is conveyed up the creek for 1,200 feet to the Company's mines.

At the time of my visit the mill was concentrating ore from the *Tariff Mine* and seemed to be making a very good and close concentration. The working staff consisted of four men.

Mines.—This Company owns four claims, the *Budweiser*, *Superior*, *Amazon*, and *Wakefield*, all Crown-granted and situated a short distance up the creek. The property was not being worked, nor could I find that any immediate resumption was in contemplation.

No. 1 Tunnel.—This tunnel, on the south-west side of the creek, was in some 150 feet, but I could not see that any ore of value had been struck. The tunnel is said to have been driven in the hope of striking a continuation of the lead showing across the creek in No. 2 Tunnel.

No. 2 Shaft and Tunnel.—This shaft is down 50 feet and the tunnel is in 90 feet, approximately, disclosing a rather weak fissure vein cutting the schist formation and carrying a small quantity of galena and zinc blende.

No. 3 Tunnel, on the south-west side of the creek, a little further up and about a quarter of a mile from the lake, had been run in about 260 feet, with a few stopes, on a quartz vein cutting the formation, and which had a width varying from 0 to 5 feet, being rather "pockety," and containing a small percentage of galena and iron sulphides. The concentrates are said to have run 76 % lead and 15 oz. silver, with a little gold. At a point 60 feet in from the mouth of this tunnel a winze, which was then full of water, had been sunk for about 60 feet.

About 60 feet further up the creek a small tunnel had been run in 20 feet, on either the same lead or a branch of it.

The *Boulder Tunnel*, on the N.E. bank of the creek, had been run in about 80 feet, but was in wash for all that distance.

No. 4 Tunnel, on the N.E. bank of the creek, had been begun on the middle one of three quartz veins, which varied from 1 to 6 feet in width. After following this for a short distance the tunnel took a sharp turn to the right and cross-cut to the next vein, which was followed for a short distance. These veins carried a very small percentage of iron sulphides, apparently not of value.

This group, consisting of the *Sunset* and *Mayflower* mineral claims, is **Sunset Group.** situated at the very head of Woodberry Creek, some 12 miles from the lake, and at an altitude of 6,700 feet. Starting from a point on the S. W. side of the basin at the head of the creek and on the *Sunset* claim, a quartz vein, varying from a few inches to 3 or 4 feet in width, can be traced over a summit in a S. 25° W. direction into the next basin, cutting through granite. The course of the vein is much covered by huge boulders, &c., but it is uncovered at intervals, and seems fairly continuous.

In this second basin No. 1 Shaft had been sunk for 46 feet on an exceedingly promising showing of galena and iron sulphides occurring in the vein, but which, in the course of development, had not shown any great continuity.

A few tons of ore are said to have been shipped from here, but I was unable to learn what values were obtained.

On the other side of the hill, *i. e.*, in the first basin, a short tunnel had been run in near the summit on the vein, and just below this a shaft (No. 2) had been sunk 70 feet, connecting below with a tunnel (No. 1) at a point 140 feet from the mouth of the latter, which had then been continued for 60 feet further, or to a total length of 200 feet.

It was the intention of the management to drive this tunnel through the hill, some 413 feet further, to connect with No. 1 Shaft, which shaft will have to be sunk some 72 feet to meet it. From the point from which this vein was first traced, indications pointed to its

being continued to the N. E. across the basin, and a vein, presumably the same, was found on the hill on the N. E. side of the basin, and still on the *Sunset* claim.

This part of the vein appears strong and well defined, with galena in bunches; the quartz is "rusty," and is said to carry gold values.

On this lead No. 2 Tunnel had been driven in some 255 feet, probably into *Mayflower* ground, and if continued some 50 feet further would emerge into daylight in the next basin.

No. 3 Tunnel is lower down, and is a cross-cut to the same lead, striking it at a depth of 55 feet and had been run on the lead a few feet, but not a sufficient distance to show its character at this depth. This tunnel, if continued 550 feet further, would, it is calculated, also come out in the next basin.

The property is a prospect of some promise; there has been a little good ore already taken out, but so far no ore body of importance has been uncovered.

The Company has constructed up to its properties a very good trail, which branches off the old *Pontiac* trail at a point where that trail begins to climb up the steep hillside from the valley, and, down in the timber, out of the way of snowslides—which may cause trouble on other parts of the property—the Company has built good cabins and a cook-house.

The *International* mineral claim is situated to the south-west of and adjoining the *Sunset*, and is owned by C. F. Caldwell, *et al.* On this property there is a tunnel, 30 to 35 feet long, run on a lead similar to that of the *Sunset*, and showing in places bunches of galena, 18 inches wide, but not continuous.

The *Vernon* is a claim adjoining the *International* on the south-west, and is said to belong to the same parties. Two assessments only had been done on the property.

These properties are situated near the head of Woodberry Creek, and are owned by Heap & Heath, of Ainsworth. Some 20 tons of ore, carrying good values in lead and silver, are said to have been shipped from this property in 1898, and some 160 tons in 1899. The ore is an argentiferous galena, mixed with a considerable percentage of zinc blende and iron sulphides.

It is reported to me that the mine was under bond to a certain English syndicate, the manager of which simply "guttled" the mine, doing no timbering, and that it is in consequence of this that all three of the levels have caved in. Whatever the cause, in such a disgracefully unsafe state did I find the property that I considered it necessary to make a special report to the Minister of Mines on the subject, under date of August 2nd, 1899.

On the north-west side of the creek, about half a mile above Cottonwood Creek, I visited a claim, of which I was unable either to find the stakes or to learn the name, but was told it belonged to Workman, Grant and Underhill.

The lower tunnel is some 100 feet vertical above the trail, and has been run in for 15 feet in black slates, while some 150 feet further up the hill a second tunnel has been run in about 100 feet, also in black slates.

This latter tunnel was closely timbered overhead, and could not be seen, but I could find no mineral in the "face," nor could I perceive indications on the dump of mineral having been found in the tunnel.

SOUTH FORK OF KASLO RIVER.

This mine is situated about 8 or 10 miles from Kaslo, on the South **Montezuma Mine**. Fork, at an elevation of from 5,500 to 5,900 feet above the sea level. The owners of the property were Hughes & McMicking, of Seattle, but I understand has gone into the hands of the Receiver.

On the hillside, at an elevation of 5,900 feet, there was an exceedingly large "capping" of iron, zinc blende, and galena, which had been stripped extensively, and seemed to indicate a vein dipping 70° to about S.E. (the compass was affected by local attraction).

The country rock consists here of bedded limestones and slates, with a strike of about S. 60° E.

About 20 feet below this surface showing, a tunnel, No. 1, is in some 60 feet. Eighty feet below No. 1 tunnel, No. 2 had been driven in for 220 feet. Some 310 feet below No. 2 tunnel is No. 3, driven about 750 feet, from the inner end of which an upraise has been made for 310 feet, connecting it with the inner end of No. 2 tunnel. Small cross-cuts had been made at several places. There had evidently been a chimney of ore, extending for a greater part of the upraise, but not averaging more than 20 to 30 feet along the vein. This ore had been practically all stoped out, and such little prospecting as had been done had failed to disclose any further body. It must, however, be said that no systematic prospecting by drifts had been done, except to a limited extent, and when word came to shut down the mine on August 2nd, it appeared as if another ore body was being approached in one of the short drifts then being made.

The ore that had been taken out had been sent down by wire rope tramway to the concentrator on the South Fork, a distance of 8,700 feet. The tram line had, however, in one or two spots, been run across places where snowslides were sure to occur, and had been swept away by the snow.

I was told that the ore concentrated about $5\frac{1}{2}$ to 1, and that about 510 tons of concentrates had been shipped, which contained about 60 % lead and 50 oz. of silver to the ton.

There were very good and comfortable buildings at the mine, and an air compressor, driven by water power, but provided with a boiler and engine for use when the creek was low in winter.

Concentrator. The mill is situated on the flat in the river bottom, and on the main South Fork waggon road. It is an exceedingly well built and equipped mill, and is in good condition. The building is well designed and well built, and contains the following plant, taken in order :—

- Bins—filled from aerial tramway.
- Short grizzly.
- Crusher.
- Bins for crushed ore.
- Rolls (made by E. P. Allis Co., of Milwaukee).
- Elevator.
- Trommels.
- Six 3-compartment jigs.
- One 2-compartment jig.
- Two pairs re-crushing rolls.
- Two double-decked Evans round tables.
- Large V-shaped sluice troughs.

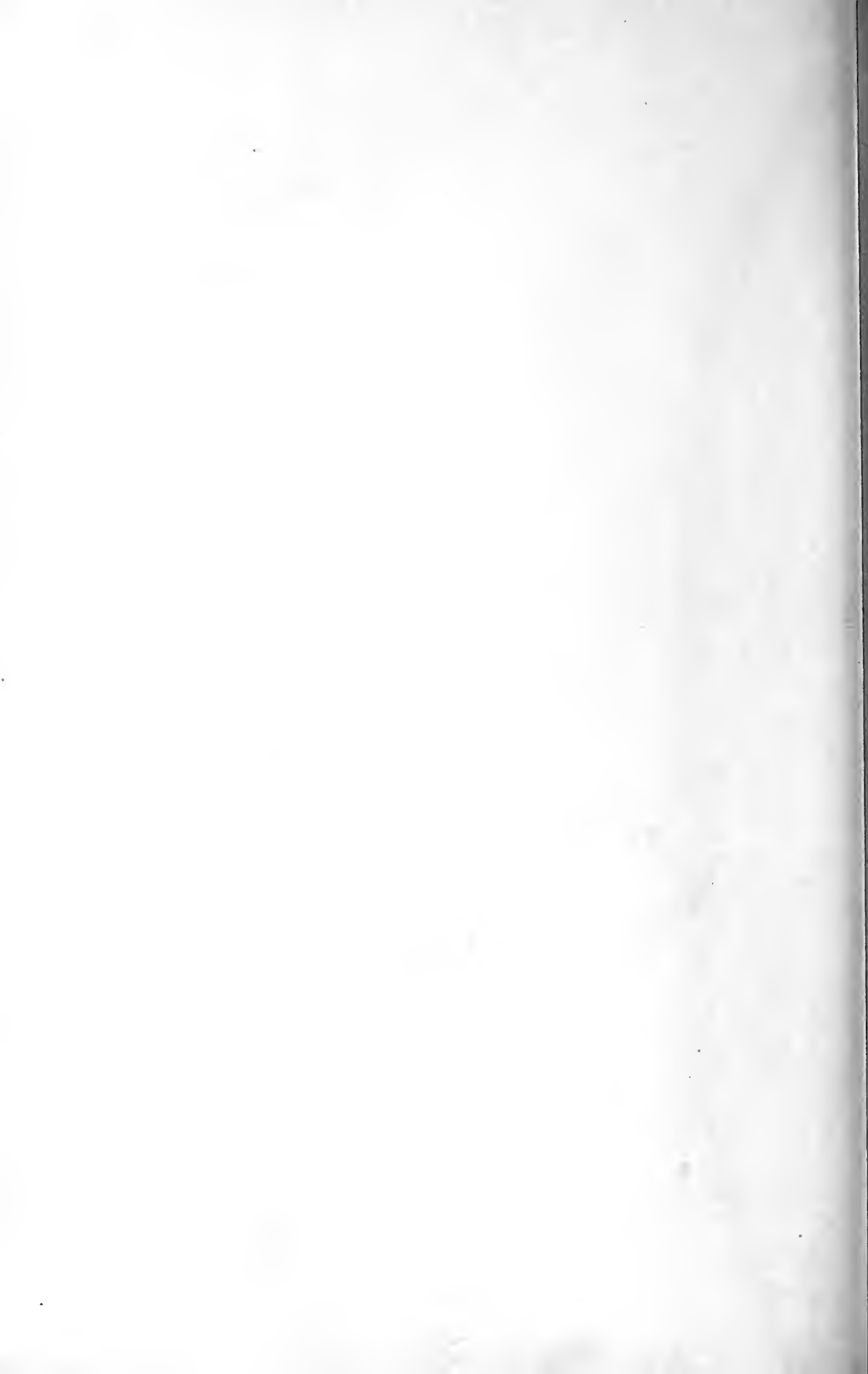
The power is supplied by a Pelton wheel, fed through a 10-inch pipe, under a head of 86 feet, with water brought by a 30 by 36-inch flume from $1\frac{1}{4}$ miles up the river. The mill and other buildings were lit by electricity, generated by a small dynamo directly coupled to a small Pelton wheel, fed by a separate penstock from the main flume.



No. 1 MINE—HOT SPRINGS CAMP, AINSWORTH M. D.



WOODBERRY CREEK CONCENTRATOR, AINSWORTH M. D.



The Trust Mining Co., of Spokane, owns this group of eight claims, Trust Mining Co. situated on the west slope of the South Fork, about one mile above the Group. Montezuma Concentrator. The group consists of the following claims:—*Lime Cliff, Contact, Liberty Hill, Stars and Stripes, 16 to 1, 3 Brothers, Success, and South Fork.* The group has had very little work done on it, and it cannot be said as yet that any workable body of ore has been struck. In several places there are showings that give some promise, but which will require development to prove their extent.

The ore is an argentiferous galena, occurring in pockets and mixed with some zinc and iron sulphides, all much oxidized near the surface. Clean samples of the galena run about 60 % lead and 40 to 60 oz. silver.

The country rock is lime and slates interbedded, and is cut up considerably by porphyry dykes.

The *Cliff* mineral claim; elevation, 3,600 feet. The following is a brief description of the developments:—*Tunnel* of about 60 feet, very crooked, chiefly in limestone near a contact with a porphyry dyke. It was started on a showing of galena, iron, and zinc, and continued to prove an ore body showing on the surface higher up, but it was not very successful. There are three open cuts—1st, on contact of upper lime and porphyry; 2nd, seemingly in lime, having bluish limestone on one side and yellowish on the other; 3rd, at a contact of lime with the slates, with a small porphyry dyke running with the measures, and having a strike S. 75° E. and dip 60° to south. There is here a rather good showing of iron oxides, containing bunches of galena and iron sulphides.

Stars and Stripes Mineral Claim. There is a tunnel on this claim which has caved in. It is said to be 23 feet in length. There is a very fair surface showing.

Some 60 feet below this, on *Liberty* ground, a tunnel has been run in, presumably on the same lead. This shows up some good galena, and a small shipment of 12 sacks is said to have yielded 56 oz. silver to the ton.

The *16 to 1* mineral claim has an open cut showing iron sulphides, with zinc blende and a little galena.

Some 60 feet lower down, a cross-cut tunnel has been run in some 50 feet to N. 50° W., cutting the lead showing above on the surface. From this point a winze follows the lead down 30 feet, and from the bottom of this winze a drift, 13 feet long, has been set off.

In the face of the tunnel there was a showing of iron sulphides, with some galena, which continues down the winze, and is said to continue in the drift as three 1-inch bands of galena in iron oxides. This latter I could not verify, as the drift was full of water.

This group consists of two claims, the *Liberty* and *Mastodon*, and Slocan-Liberty adjoins the preceding group, the same conditions prevailing on both properties. Hill Group.

On the *Liberty Hill* claim, No. 1 Tunnel has been run in 157 feet; it was started on a contact of lime and porphyry, but afterwards got into porphyry alone.

No. 2 Tunnel was in 182 feet, and was timbered and lagged most of the way; no ore showed, and I was told that no lead had been struck.

This tunnel is about 75 feet below a large surface showing, carrying galena, a small shipment of which is said to have yielded 56 ounces of silver to the ton, while picked specimens gave nearly the theoretical 86 % of lead.

From near this showing a shaft had been sunk 57 feet, dipping N. 20° W. at an angle of 50°, in which a very small percentage of galena showed, but, such as it was, it appeared to be fairly continuous. It is claimed that the shaft "ran over the lead, and is in country rock,"

but this I could not verify, on account of the water in the shaft. Across the gulch another small tunnel of 32 feet had been run, and showed up a little galena, but nothing of any importance.

Near the mine cabin is a cross-cut tunnel, driven in porphyry all the way. At about 100 feet in, it cuts a lead of quartz and "irony" material, carrying a couple of inches of galena.

Consists of the *Silver Bell* and *Hub* mineral claims, owned by R. F. Silver Bell Group Green and the Martin brothers, of Kaslo. This group is situated on the eastern slope of the South Fork of Kaslo River, above Lake Creek, and at an elevation of 5,100 feet.

The development work consists of several short tunnels, 10 to 20 feet below the surface, on what appears to be a broken and overturned lead, which has been taken out along the surface for some 200 to 300 feet. These small tunnels had mostly caved in, and did not permit of any accurate idea being formed of the mode of occurrence or the extent of the deposit.

Some 30 feet vertically below these surface workings, a main tunnel had been driven, 150 feet in all, which exhibited in places very considerable bodies of lead carbonates and iron oxides.

Solid formation did not seem to have been reached in any of the workings, as far as I could see. From what could be seen of the ore body and of the ore on the dump, the property seemed to be one of very considerable promise and importance, and it is a pity the work has been carried on in such a slipshod manner. The galena is said to run very high in silver, assays as high as 600 oz. to the ton having been received. From shipments recently made, returns were received of 280 oz. of silver per ton on a 15-ton lot, and of 150 oz. per ton on a 45-ton lot.

The *Monarch* mineral claim is owned by Briggs Bros., Kaslo. An exposure on the side of a brook near Ben Hur Creek shows a 6 or 7-foot ledge of quartz, with a strike S. 30° W., and a dip of 50° to S.E. The quartz carries a fair quantity of galena, with 60 to 70 oz. of silver to the ton, but as only about \$50 worth of work has been done on the prospect, the extent and value of the showing is not known. The hanging wall of the lead is slate; the foot-wall has not been exposed directly, but is likely to be of limestone. Certain other stripings have been made which only expose the surface of the ledge.

Old Timer mineral claim; same owners; elevation, 4,200 feet. The formation consists of slates and schists, with a strike S. 30° W., and a dip to S.E. of from 50° to 80° into the hill. There are on the property three leads, running with the formation, and composed of broken schistose matter, with some infiltrated quartz, lying on a smooth foot-wall. A cross-cut tunnel, 248 feet long, runs into the first of these leads, on which a drift had been run to the right for 75 feet and to the left for 80 feet. There is in this tunnel a fair showing of galena, for a prospect; a shipment of one ton gave assays of 72 oz. The other ledges have been prospected only on the surface. There is a second tunnel some 32 feet long on the same ledge.

The *Daisy* mineral claim, owned by the Black Fox Mining Company, is situated on the south bank of the South Fork, about two or three miles above the *Montezuma* Concentrator. On the trail to the claim there is an open cut, exposing a large interbedded quartz ledge about 8 feet wide, on which a shaft is down 57 feet, and from which there was taken a small quantity of galena, said to assay from 50 to 70 oz. in silver, and from \$2 to \$7 in gold, per ton.

Some distance below, on the gently sloping hillside, at an elevation of 3,700 feet, a tunnel had been driven (S. 50° E.) for 340 feet, apparently cross-cutting five parallel quartz ledges.

At 300 feet in from the mouth of this tunnel a drift had been run to the right (S. 40° W.), on the fourth quartz ledge, for about 40 feet, and at 330 feet in another drift had been run to the right, along the fifth ledge. In both these drifts the ledges grew much weaker to the S.W. To the left (N. 50° E.) a drift followed the fourth ledge for about 120 feet. At 100 feet in on this drift a cross-cut of 30 feet was made to S.E., to the fifth ledge, and a drift run on the latter to the S.W. for 20 feet. At 120 feet in on the main N.E. drift a half cross-cut (N. 80° E.) was also run to No. 5 ledge, which was then drifted on (N. 50° E.) for 20 feet. In the main drift a couple of upraises and a winze had been made, apparently following ore chutes. Galena, which might be concentrated, is distributed rather irregularly through these ledges, but the development has not yet disclosed any continuous body of ore.

At an elevation of 3,600 feet, and some 300 feet to the N. 20° W., another small tunnel had been run in 35 feet, while, at an elevation of 3,800 feet, almost above the main tunnel, another was in some 60 feet, neither showing important mineralization, however. The total work done on the property amounts to, approximately, 1,000 feet.

There are a number of promising prospects on this Fork, which I was unable to visit in the short time at my disposal, without camping out, and for this I was not equipped.

The *Joker Group*, at the very head of the Fork, is reported to me, by one of that Company's officers, as belonging to the Excelsior Gold Mines, Ltd., and as having a shaft down 75 feet, and a drift of 105 feet, on a vertical quartz vein about 2 feet wide, which cuts through granite. The values are in gold, from \$20 up per ton, occurring in iron sulphides, which will have to be concentrated or treated by cyanide or other process.

The *Gibson* and *Palouse* mineral claims are reported as of considerable promise, and as having a good deal of work done on them. There are three or four tunnels, of which No. 1 is in 65 feet, with a cross-cut to the left, and No. 3 is on a secondary lead. A shipment of 14 tons of ore, which ran 78 % lead and 73 oz. silver per ton, is said to have been made in 1895.

AINSWORTH MINING DIVISION.

REPORT BY JOHN KEEN, MINING RECORDER.

I have the honour to hand you my report on the Ainsworth Mining Division for the year ending 31st December, 1899.

The boundaries of this Division have been somewhat altered during the past year, all that portion of the old Division lying to the south of and including the watershed of Gray's Creek on the east side, and all south of Balfour on the west side of Kootenay Lake, having been cut off from this Division and added to the enlarged Goat River Mining Division; while on the north the Division has been enlarged by the addition of that portion of the watershed of Duncan River which was formerly included in the Trout Lake Mining Division, thus extending the boundary of the Ainsworth Division northward to the divide between the headwaters of the Duncan River and Beaver Creek.

This change has been a source of great satisfaction to the actual prospector, who has had occasion to record claims from that locality, for as soon as he locates his claim all he has to do is to follow the waterways and he will arrive at the Record Office of the Division at Kaslo or at the sub-office at Duncan, instead of having to climb over a difficult summit to the Record Office, as had been necessary under the old arrangement. The expressions of satisfaction at

the action of the Government in this matter have been emphatic, decisive, and as unequivocal, as is usual with the average prospector. The alteration in the boundaries leaves the number of claims in the office about the same as it was prior to the alteration.

A marked change has taken place in the general business of the Division this year, from what it was last year. The kind and amount of work has in a large degree been development instead of shipping, there having been very little ore shipped owing, in a measure, to the condition of industrial economics.

The Legislature, at the last Session of the House, passed an Act to ameliorate the condition of the miners working under ground, by limiting the hours of labour to eight hours in each twenty-four. This action was met by the mine managers with a re-adjustment of wages to meet the altered conditions of time, which re-adjustment was not accepted by the miners. Mutual friends of the disputants finally brought them together, the exact points of difference have been focussed, and it is hoped that soon all will be settled to the satisfaction of both parties concerned.

As a consequence of the foregoing, quite a number of men left for other fields of labour, which in the year just closing have been very numerous all over the continent; some have gone into prospecting, and others have gone into contracts for development work, and, as a result, the mines are in a more perfect condition for the production of ore to-day than they ever were before in the whole history of the camps.

SOUTH FORK CAMP (KASLO RIVER).

This camp has made great progress this year, not so much in new discoveries as in the work executed on old prospects, the sale of developed claims, and the development work performed by the purchasers.

The Excelsior Gold Mining Company, managed by Mons. J. J. Fleutot, with headquarters at Kaslo, has been working on the following mineral claims: *Joker*, *Derby*, *Mona* and *Mona Fraction*, all of which have been Crown-granted this year. Twenty men have been employed all the season, and work will be continued through the winter. The ore is free-milling and will be treated on the ground.

Another new company is the Pactolus Gold Mines, Limited, with head office at Nelson, which has the following mineral claims: *Pactolus*, *Champion*, *Lost Boy*, *Trixeey*, *Silver Maiden* and *Kevera*. The character of the ore is the same as on the last-named claims, viz.: free gold rock, and will be treated on the ground. Fifteen men are at work on the properties, and work will be pushed continuously.

Camp Mansfield, at the head of the South Fork, is a lively camp, some 20 claims in which are under bond to Ernest Mansfield, after whom the camp derived its name. This gentleman is acting in the interests of English and French capitalists, and has rendered himself quite a prominent figure by the success he has had in getting hold of many very valuable claims, all of which are being energetically worked during the life of the bond, to prove their value prior to the completion of the purchase.

A great demand is being made for the continuation of the South Fork waggon road to the head-waters, by far the largest number of the best claims lying at and near the summit. It is not too much to say that the extension of the road this year for several miles has had more to do with the life that the camp has seen than anything else, and the parties interested are very anxious for further assistance in this direction. The actual cash spent on this camp this year, in bonds, rations, wages, trails (including the purchase of the controlling interest in the Excelsior Company at a cost of \$70,000), is not less than \$200,000.

Of the rest of the more prominent claims, the bulk have had little done on them this year but prospecting and obtaining Crown grants therefor; very few of them have, however, been allowed to lapse.

The *Montezuma* has been shut down, pending a change of management and a readjustment of the Company's affairs.

THE WHITEWATER CAMP.

This camp has had very little done with it this year. The *Whitewater*, *Whitewater Deep*, *Jackson* and all the other mines shut down about June, and prior to that simply devoted their attention to putting things in shape and concentrating the ore which lay on the dumps.

THE AINSWORTH OR HOT SPRINGS CAMP.

This camp, lying ten miles south of Kaslo, has been fairly active all the year. The *No. 1* shaft is down some 600 feet on the vein, and the owners are preparing to take out ore next year, with 30 men on the pay-roll.

The *Little Phil* is not working at present, but is expected to open up on the 2nd of January, proximo.

The *Tariff* has been working 12 men, and has shipped some ore of medium grade. The mine was sold last month to new people, who are now working it with satisfaction to themselves. The ore goes about 30 oz. in silver and 60 per cent. lead. All the ore in this camp is argentiferous galena, with some carbonates and ochreous material.

The *Norman*, *Eden*, *Crescent*, *Neosha*, and the other old and well-known claims, have not been worked this year, one reason alleged being for want of good transportation facilities, especially around Coffee Creek.

Good development work has been performed on the *Star* by some 22 men, who have put several hundred tons of ore on the dump, which at present cannot be got out, there being hardly enough snow on the ground for sleighing.

Generally, all the claims have had sufficient work done upon them to hold them under section 24 of the Mineral Act, and those which are Crown-granted have had at least \$200 worth of work done on them, exempting them from the operation of section 145 of the Act.

CRAWFORD CREEK CAMP.

This camp has had considerable development work done this year, and good results have been had therefrom. The Maple Leaf Mining and Development Company has been at work unintermittently all the year, and will continue so all winter. No ore will be shipped till the mine is well opened up and a suitable trail or waggon road put in for hauling, which with the present trail is an impossibility.

All the claims in this camp have been maintained and some work has been executed on all of them, but nothing has been shipped.

BLUE RIDGE CAMP.

The claims on this hill have been all represented this year and a little development has been done to prepare them for sale, but the season was very backward and little but necessary work has been done.

LARDO-DUNCAN RIVER CAMP.

This camp has, this year, had more prospecting done in it than any camp in this Division, and all the old claims were represented by the annual assessment work. The season was a very late one and the Minister of Mines consented to the opening of a sub-office at Duncan City to aid the prospectors, who were late in getting their work done. This arrangement gave

the men two days more time for their work, as the office at which they could record was that much, in time, nearer to the claims, and it has been highly appreciated by all concerned in mining matters.

Surrounding Howser Lake there have been a large number of claims located. The *Lavina Group* has been surveyed and applications are in for Crown Grants. The property is said to be looking well and a large outlay has been made this year in development work. The ore is galena carrying silver and some gold.

A large number of old claims have been Crown-granted this year, and many others are being prepared for Certificates of Improvement, preparatory thereto.

The *Chicora Group* comprising the *Chicora, Foy, Onagara, Iron Mask, Red Cloud* and *Black Prince* is working seven men and it is in contemplation to open up and ship next season.

Howser Creek has a trail along it for about five miles. Much prospecting has been done here and also many assessments done and recorded. The ore is silver-lead and some copper and gold. The best known claims include the *Trilby, Laird, Svengali, New Orleans, Della, Unique, Bourke, Red Cloud, Mountain Scenery, Carlson, Lone Pine, Klondike, Ida, Uriel, McLean, Merry Eagle, Iona, Green Idol, Panther, Noewood, Echo, Hopeful, Rossa, McArthur, Teddy S.* and others.

TWO-MILE CREEK.

There is a trail "brushed" on this creek for a distance of about two miles. Only seven claims are located thereon. The ore is galena.

Dunn, Bear, Bear Trap and Great Falls Creeks all cut through the same mineral belt of galena with some gold and copper ores.

Bear Creek has a tolerably good trail along it for about three miles, and is used to get to the heads of the other creeks named. The principal claims are the *St. Lawrence, Glacier, Iron Hand, Not Known, Silver Tip, Colby, Cliff, Concentrator, Big Jam, Cuba, Standard, Big Annie, Silver Queen, Climax, Non-Such, Cariboo* and *Wood Chuck*.

EAST RIVER.

This is a full flowing stream of great volume running in a north-easterly direction. The ores found hereabout are galena, copper and gold. The principal claims are the *Rising Sun, Morning Star, Lucky Jack, Black Prince, Gibson* and *Fraser*, upon which considerable work has been done during the year and all are showing up well.

WEST FORK OF DUNCAN RIVER.

This is a most important stream. It enters Duncan River about 12 miles from the head of navigation and runs parallel to the main river. A waggon road is being asked for, and this will serve Cariboo Creek and Hall Creek, at the head of which latter is situated the *Bannockburn Group*, on which has been spent many thousands of dollars this year. There are some 200 claims on these creeks, which are being transferred to the records of this office from Trout Lake, and of which I am unable to say much this year, but they all are well spoken of and are attracting much attention from men well posted on mining matters. The best known are the following:—*Silver Leaf Group, Black Warrior Group, Glengary Group, Highland Group, Johnson Brothers Group*, and *Wagner Group*.

There have been employed in this camp during the year some five hundred men, and arrangements are now being made to ship next year from those claims which can be reached by road.

This year a railway has been partially built on the East side of the Lower Duncan River by the Lardo-Duncan Railway Company, and on the West side by the Canadian Pacific

Railway Company, both companies intending to reach the large belts of mineral before the next season for shipping opens. This fact alone has done much to cause mining work to be prosecuted as energetically as it has been this year, for nothing tends so much to open up mines, where they exist, as good roads and more especially railways.

Generally, it may be said that the out-look for the next season is good. All eyes are turned on the last mentioned camp and the South Fork Camp, to do great things, and with the transportation facilities increased they should go ahead.

OFFICE STATISTICS—AINSWORTH MINING DIVISION.

Number of new claims recorded	619
" certificates of work	979
" payments in lieu of work	29
" Free Miners' Certificates (individual)	989
" (Company)	25
" (special)	8
" Mining Receipts issued	1,602
" Certificates of Improvements recorded	62
" notices filed	258
" Bills of Sale and Bonds recorded	379
" Water Notices recorded	7
" surveys recorded as work	56
" Field-notes deposited	74
" abandonments filed	1
" abstracts of titles furnished	15
" letters received	4,323
" " written	2,672

ARROW LAKE MINING DIVISION.

REPORT BY F. G. FAUQUIER, MINING RECORDER.

In sending you my report of the mining industry in this Division, I regret that it is so poor, the receipts and the amount of work done being not even equal to that of past years. This I attribute to the labour trouble of the past few months, which has affected all this portion of the country.

In "Cariboo Creek" Camp, outside of actual assessment, only two Silver Queen, properties have been working, but these have had satisfactory results. Chieftain Groups. These were the *Silver Queen Group*, owned by the "Silver Queen Mining Company," and the *Chieftain Group*, by Messrs. Clark, Burns & McKenzie. On the former the ledge was struck in place, as well as several stringers, all carrying pay ore. The property has been closed down for the winter months, owing to the prevalence of snow-slides, which gave great trouble last winter, but I understand work will be resumed in the spring. A large amount of development work has been done on the *Chieftain Group*, but more will have to be done before it can be classed amongst the regular shippers.

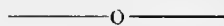
At the "Needles" Camp nothing but development has been done, but some of the properties have such excellent showings that no doubt a little more work will make it a camp to be proud of.

The place that is causing the greatest excitement (and with good cause) Old's Mountain. is the Fire Valley and Kettle River country. Some two years ago the Old Brothers and Page located a group of claims on what is now known as "Old's Mountain," about eighteen miles from the Lower Arrow Lake. They have worked on this continuously, with the result that they now have what is pronounced to be one of the most promising group of claims in the country, and for which they have refused offers up in the hundred thousands, thinking that the property will be worth, with a little more work, an amount that will make them independent. Following up the success of the Olds, many prospectors went in this summer, and some splendid samples of free-milling rock have been taken out from that country. On a number of claims located the rock appears to carry tellurides, showing native gold.

During the past season most of the supplies for this part have come in from Vernon, on account of the waggon road. This makes a distance of some sixty miles, whereas it is only twenty-five, or thereabouts, by way of Fire Valley trail, and no doubt when there is a good road built from Arrow Lake this will be the way for supplies to go in and for ore (of which latter the Olds now have on the dump several car loads) to come out.

OFFICE STATISTICS—ARROW LAKE DIVISION.

Number of claims recorded.....	168
" certificates of work.....	162
" " improvements.....	14
" Bills of Sale, &c.....	122
" Crown grants.....	14
" payments in lieu of work.....	3
" Free Miners' Certificates.....	211



GEOLOGY OF THE NELSON DISTRICT.

The following is from the Report of the Geological Survey of Canada for 1897—recently issued—and is a part of the Report of Mr. R. G. McConnell on the work of his party in the field during the summer of 1897:—

"We were occupied principally in the south-eastern portion of the map-sheet in the unmapped region between the Salmon River and Kootenay Lake and River, and south of Midge Creek; but work was also carried on east of Kootenay Lake, on the north fork of the Salmon, in the group of mountains between the Salmon, Beaver and Pend d'Oreille rivers, on the Slocan River, on Ten-mile Creek, Slocan Lake and on the Nelson and Fort Sheppard Railway. An effort was in fact made to collect sufficient data for a general geological and topographical map embracing the region in which the principal mining camps of West Kootenay are situated. The material on hand is now being compiled and drafted.

"The principal topographical feature of the country examined is its persistently mountainous character. The whole region, with the exception of the valleys of the Kootenay and Salmon, being simply a succession of high mountain ranges, separated by narrow, steep-sided valleys that have been carved out by the torrential streams draining the district. The principal streams engaged in this work between the Salmon and Kootenay, north of the International boundary, are Lost Creek, Sheep Creek, Hidden Creek, Porcupine Creek, and

Wild Horse Creek, flowing westward into the Salmon ; and Boundary Creek, Summit Creek, Shaw Creek, Cultus Creek, and Midge Creek, flowing eastward into Kootenay Lake and River. These streams head in a high range of quartzite and granite peaks and ridges that extend from the boundary north to Ymir Mountain. From the summit range transverse ridges, gradually decreasing in height, but often swelling into high peaks, extend outwards to the main valleys.

“East of the summit range, a prominent group of mountains, with peaks occasionally exceeding 8000 feet in height, occurs near Kootenay Lake, between Cultus and Summit creeks. They are built of granite, and owe their superior elevation to the greater resistance offered to denudation by this rock than by the surrounding softer schists.

“In the area between the Beaver, Pend d’Oreille and Salmon rivers the streams have not cut so deeply, and the mountains are round-topped and have a more uniform elevation.

“The valleys and the slopes of the mountains up to an elevation of about 7500 feet are, or have been, wooded more or less densely with spruce, pine, cedar, hemlock, etc., but, as in other parts of the district, the trees have been destroyed over large areas by forest fires. A list of the forest trees is given in last year’s summary.

“The geology of the district is extremely complicated, and has only been deciphered so far in a general way. It will be unnecessary to more than mention its salient features here, as it will form the subject of a report which is now being prepared.

“The four main groups of rocks are the granites ; the dark eruptives and associated fragmental rocks ; a schistose series of exceptional thickness, which includes greenish, grayish and dark schists and slates, crystalline limestones, dolomites, quartzites and conglomerates ; and the basal Shuswap series, consisting here as elsewhere of mica-schists, mica-gneisses, crystalline limestones, dolomites and quartzites. It is probable that the schists and associated rocks are all of Cambrian age ; the dark volcanics, so far as known, belong mostly to the Carboniferous, and the granites are chiefly of post-Triassic age.

“The dark volcanic rocks cover most of the area between the Beaver, Pend d’Oreille and Salmon rivers, except the south-west corner, which is occupied by schists that extend northwards along the main and north fork of the Salmon until cut off by the granites near Toad Mountain. They are replaced, east of the Salmon, by slates and schists that have been referred to the Nisconlith, a much older series. The rocks of this group include porphyrites of several kinds, monzonites, diabases, gabbros, breccias, tuffs, agglomerates and dark, fine-grained, slaty ash-rocks.

“Grayish medium and coarse-grained and porphyritic granites, similar to those described in previous progress reports and belonging to the same period of eruption, occur everywhere in dykes and areas of various sizes throughout the district examined. Several areas were outlined on Boundary Creek, west of Kootenay Lake between Cultus and Summit creeks, east of Salmon on Wild Horse, Hidden and Porcupine creeks ; and a number of smaller bosses occur cutting the quartzites and schists which form the summit range between the Salmon and the Kootenay.

“Besides the ordinary gray granites of the district, an older granite, somewhat similar in appearance, occurs in a few places along Kootenay Lake, cutting the Shuswap and Cambrian schists ; and a younger reddish granitic rock has a wide distribution, but, except on Granite Mountain, does not occur in large continuous areas.

“The great igneous activity which has characterized the district in the past is shown by the fact that igneous rocks belonging to six distinct invasions are easily distinguished in the region examined during the season, and it is probable that, with more detailed work in the

field, and with the microscope, the list would be increased. The oldest eruptive rock detected is a diorite, which is found intercalated in and cutting the schists of the Shuswap series. The diorite is followed in order by the older granites, the porphyrites and altered rocks so largely developed in the south-western part of the field, the ordinary gray granites, the younger granites and associated syenite-porphry dykes, and, lastly, by a system of basic dykes belonging to the basaltic group. Besides the massive rocks just enumerated, a large proportion of the Shuswap and Cambrian schists represent igneous rocks which have been crushed and altered into their present conditions.

“Between the Salmon River and Kootenay Lake and River, the rocks are mostly schists, cut by numerous granitic intrusions. The schists have a general north-and-south strike, and dip steadily eastward. Sections were examined on Sheep and Lost creeks, flowing into the Salmon, and on Summit Creek, which flows eastward into the Kootenay. The sections are interrupted in many places, owing to the absence of exposures, but are sufficient to show a division of the rocks into three great groups, each many thousand feet in thickness.

“From Salmon River eastward, for several miles, the rocks consist mostly of hard, lead-coloured slates, usually somewhat siliceous, and showing as a rule on cross sections numerous fine lines, due to a separation of the laminae by thin quartz films. The slates are always more or less altered, and in places pass into micaceous schists. They include bands of greenish schists, quartzites, and grayish and whitish crystalline limestones. The slates have an average dip to the east of 50 degrees. They are succeeded and overlain on the east by a complex set of rocks, consisting of alternating bands of greenish, grayish and dark schists, grayish and white quartzites, usually rather heavily bedded, fine and coarse hard conglomerates with a matrix of quartzite or schist, yellowish granular dolomites and massive green diabases. These rocks resemble the Selkirk series as described by Dr. Dawson. They are overlain by a great volume of quartzose mica-schists ranging from quartzites holding a few grains of mica arranged parallel to the bedding, to well developed lustrous mica-schists. The quartzites occur in thin regular beds, usually from one to three inches in thickness, separated by narrow schistose bands which are often crumpled. Crystals of kyanite were found by Mr. Brock in the ridge south of Summit Creek scattered through a band of coarse biotite-mica-schist included in this series. The schists last described extend eastward to Kootenay Lake. They dip to the east, and apparently overlie the rocks referred to the Selkirk series, but show greater alteration. This may be due, however, to the vicinity of the granite masses on Boundary Creek and on Summit Creek.

“The three groups of schistose rocks briefly described above are everywhere broken through by granite intrusions, and towards the north are cut off by the great central granite mass of the district.

“East of Kootenay Lake, Lockhart Creek, La France Creek, Crawford Creek and others were examined for varying distances from the lake. On Lockhart Creek the section shows dark slaty rocks and green schists near the lake, and underlying these the conglomerates, quartzites and schists of the Selkirk series. The position of the group is the reverse here of what it is in Lost Creek, where the slates underlie the quartzite-conglomerate beds, and it is probable the whole series is overturned.

“On Crawford Creek the section commences with the gray gneisses, mica-schists, quartzites and crystalline limestone of the Shuswap series, cut by a network of granite, pegmatite, and diorite dykes. The Shuswap series is succeeded and apparently overlain towards the east by the greenish and grayish schists, quartzites and conglomerates of the Selkirk series. The Nisconlith slates, which, when the section is complete, separate the Selkirk from the older Shuswap series, were not here recognized.

“The gneisses and associated crystalline rocks of the Shuswap occupy the basin and lower slopes of the valley of Kootenay Lake from its northern end to a point a few miles below Crawford Bay. They dip to the west, and are apparently overlain on the west and underlain on the east by younger rocks. The conditions prevailing lead to the inference that the whole series has been thrown into a great anticline overthrown to the east. It is also probable that the folding was accompanied by considerable faulting, as the beds on the east and west of the lake do not correspond very closely. The schists have a close resemblance, but the quartzites and conglomerates, so abundant east of the lake, are only sparingly represented to the west.

“The region examined during the past season does not include any of the larger mining camps of the district, but it is nearly everywhere more or less metalliferous, and mining claims have been staked off by the score on all the principal creeks, and on some of these claims a considerable amount of development work has been done. We were unable to devote much attention to the examination of these, as our time was fully occupied in collecting data for the completion of a general map of the region.

“The band of dark slaty rocks east of the Salmon River, that has been referred to the Nisconlith, is traversed by a number of leads, some of considerable promise. The Ymir claim, north of Wild Horse Creek, is situated in these slates, about half a mile east of their contact with the basic eruptive series. The Ymir lead cuts the slates in a direction S. 65° W., and dips to the north-west at an angle of 60° to 70°. The principal workings at the time of my visit consisted of a cross-cut 70 feet in length, a shaft at the end of a cross-cut 103 feet deep, and drifts 60 feet to the north-east and 105 feet to the south-west along the vein at the bottom of the shaft. The shaft follows an ore-body varying from 10 to 20 feet in thickness, and a cross-cut of the vein on the south-west drift, 50 feet from the foot of shaft, cut nearly 30 feet of ledge matter, of which 18 feet was stated to be payable ore, carrying values of \$20 or over, principally in gold. The ores consist of galena and iron-pyrites, with some blende, and the gangue is mainly quartz.

“The Dundee mine, on Bear Creek, a short distance south of the Wild Horse, was examined by Mr. Leach. The vein occurs at the junction of the slate with a granite boss, and is traceable on the surface for 500 feet. The strike is almost parallel with that of the rock, and it dips to the north-west at an angle of 75°. The workings consist of an incline 100 feet deep, following the foot-wall of the lead. The vein has a width of 12 feet on the surface, and increases in width with depth, as at the bottom of the incline a cross-cut of 16 feet did not reach the hanging wall. The ore consists of galena and iron-pyrites, and is stated to average \$23 to the ton in silver, gold and lead. A good waggon road has been built to the Dundee mine from the town of Ymir, on the Nelson and Fort Sheppard Railway, and another is in course of construction from the same place to the Ymir mine. South of Wild Horse Creek, a number of claims have been located along the same band of slates on Porcupine, Sheep and Lost creeks, and some development work has been done, but I was unable to afford time to examine them.

“West of the main Salmon, near the head of a branch of Barrett Creek, is the Porto Rico claim. It consists of a quartz vein, averaging about 2 feet in width and traceable for 700 feet, carrying pyrites, pyrrhotite, chalcopyrite and mispickel. Assays from this lead are reported to have run very high in gold, but the average value of the ore was not ascertained. It is situated west of the Nisconlith slates in the basic eruptive series.

“West of the summit, between Salmon and Kootenay rivers, and close to the International boundary, is situated what is known as Copper camp. A number of claims have been located here along the bands of dolomite included in the Selkirk series. The lead consists of quartz veins like the North Star, and more or less silicified bands in the dolomite,

like those of the Hanna and B. C. claims. No large ore-bodies have so far been opened up, and very little development work was being done at the time of my visit. The B. C. has a width of about 2 feet, and has the same strike and dip as the dolomite band in which it is inclosed. The ore consists of gray copper (tennantite) and galena, distributed irregularly through the vein. The pay-ore, free from gangue, is stated to run \$260 in copper, silver and gold.

“In the eastern part of the district, numerous claims have been located on Goat, La France, Lockhart, Crawford and other creeks flowing into Kootenay Lake, but I had no opportunity to examine them.”

 ROSSLAND DISTRICT.

 —o—
 TRAIL CREEK MINING DIVISION.

REPORT BY JOHN KIRKUP, GOLD COMMISSIONER.

I have the honour to present, herewith, my annual report on the condition of the mines and mining properties in the Trail Creek Division for the year ending December 31st, 1899. I have taken the liberty to preface this report with a brief reference to the rise and progress of the mineral industry of this Division for the period beginning in 1894 and ending in 1899. A reference to this comparative statement will show the progress this industry has made since its inception. It will be seen that the output of ore from Trail Creek mines, beginning with 1856 tons, valued at \$75,524.64, in 1894, had increased to 180,300 tons, valued at \$3,211,400, in 1899.

The most noteworthy features connected with the mining industry of last year are the increased productions over 1898, when the output was 111,282 tons, valued at \$2,470,811, the increase in 1899 being 69,018 tons and an increase of \$740,589 in value, amounting to 62 and nearly 30 per cent. respectively; the large amount of development work done, especially in the regular producing mines; the varied, extensive and modern character of the machinery employed; the successful flotation of the Centre Star Mining Company, its progress as a producing mine and dividend payer; and the large amount of work outlined for the future.

The amount of ore shipped by the various producers, regular and occasional, together with its value, is, for the year 1899, given in a separate table, the value of the ore for December being estimated, in the absence of complete smelter returns.

The ore shipments from Trail Creek mines for the year ending December 31st, 1899, amounting to 180,300 tons, is made up as follows, odd figures having been dispensed with:—

Le Roi	92,250 tons.
War Eagle	63,250 "
Centre Star	16,700 "
Iron Mask	5,400 "
Evening Star	1,000 "
Monte Christo	400 "
Columbia and Kootenay	110 "
Virginia	100 "
I. X. L.	100 "
Miscellaneous	990 "
Total	180,300 tons.

Statement showing the amount of ore shipped from the various producing mines, regular and occasional, together with the value thereof; also the amount of work done on properties which are not shipping, and the average number of men employed:—

Le Roi Mine: British America Corporation—Mr. Bernard MacDonald, General Manager.

Tons of ore shipped	92,500
Gross value	\$1,250,000
Average number of men employed	350

Columbia & Kootenay:

Tons of ore shipped	110
Gross value	\$1,600
Development work—driving, 4,300 feet; sinking, 750 feet	5,050 feet.
Average number of men employed	40

Nickel Plate:

Development work—driving, 1,930 feet; sinking, 440 feet	2,370 feet.
Average number of men employed	25

Great Western:

Development work—driving, 300 feet; sinking, 200 feet	500 feet.
Average number of men employed	20

Josie:

Development work—driving, 650 feet; sinking, 480 feet	1,130 feet.
Average number of men employed	20

Number One:

Development work—driving, 1,900 feet; raising and sinking, 430 feet	2,330 feet.
Average number of men employed	35

Black Eagle:

Development work done, cost	\$250
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War Eagle:

Tons of ore shipped	63,250
Gross value	\$1,138,500
Average number of men employed	250

Centre Star:

Tons of ore shipped	16,700
Gross value	\$225,950
Average number of men employed	75

Iron Mask:

Development work done	2,852 feet.
Tons of ore shipped	5,378
Gross value	\$70,268 81
Average number of men employed	40

St. Elmo:

Development work done	296 feet.
Average number of men employed	8

Gertrude:

Buildings, including plant and machinery, cost	\$ 3,380
Development work, shafting, drifting &c., 430 feet	10,564
Prospecting, &c.	190

Total cost \$14,134

Coxey :

Development work, 415 feet, cost	\$7,995
Prospecting, &c.....	300
	\$8,295
Total cost	\$8,295

Jumbo :

Tunnelling	500 feet.
Average number of men employed	5

Big Four Group :

Drifting, 32 feet, cost.....	\$500
Prospecting	200
	\$700
Total	\$700

Iron Colt :

Tunnelling in 1899.....	30 feet.
Total amount of work to date	1,400 "
Average number of men employed	20

California :

Work resumed September 5th, 1899.

Drifting	78 feet.
Waggon road built	1,600 "
Building improvements, cost	\$4,300
Average number of men employed	25

Sunset No. 2 :

Shafting	235 feet.
Drifting	1,175 "
Average number of men employed	22

Homestake :

Sinking main shaft.....	110 feet.
Drifting	630 "
Cross-cuts	29 "
Average number of men employed	19

Curlew and Parrot :

Shafting	61 feet.
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Velvet :

Drifting	564 feet.
Cross-cutting	460 "
Sinking	55 "
Raising	75 "
Average number of men employed	25

Portland :

Drifting	250 feet.
Sinking	147 "
Average number of men employed	12

Mascot :

Development work done during 1899.....	2,698 feet.
Average number of men employed	25

Southern Belle :

Development work done during 1899.....	381 feet.
Average number of men employed	10

Heather Bell :

Tunnel	60 "
Average number of men employed	5

White Bear :

Main shaft.....	368 feet.
Drifting	750 "
Average number of men employed	10

In addition to the foregoing, a large amount of work has been done on small properties in excess of the amount required for the purpose of obtaining the annual Certificates of Work.

OUTPUT OF TRAIL CREEK MINES FROM 1894 TO 1899.

Year.	Tons of Ore.	Ounces, Gold.	Value.	Ounces, Silver.	Value.	Copper.	Value.	Total Value.
1894	1,856	3,723	\$ 59,568	5,357	\$ 3,214 20	106,229	12,738 64	\$ 75,520 64
1895	19,693	31,497	602,957	46,702	27,021 20	840,429	72,385 80	702,359 00
1896	38,075	55,275	1,104,500	89,285	50,830 00	1,580,635	79,030 00	1,243,360 00
1897	68,804	97,024	1,940,480	110,068	65,821 00	1,819,586	90,079 00	2,007,280 00
1898	111,282	87,343	1,746,861	170,304	94,539 00	5,232,011	629,411 00	2,470,811 00
1899	180,300	101,500	1,928,000	272,300	169,000 00	7,785,000	1,114,400 00	3,211,400 00
	420,010	376,362	\$7,382,361	694,016	\$410,425 40	17,363,890	\$1,998,044 44	\$9,710,730 64

OFFICE STATISTICS—TRAIL CREEK DIVISION.

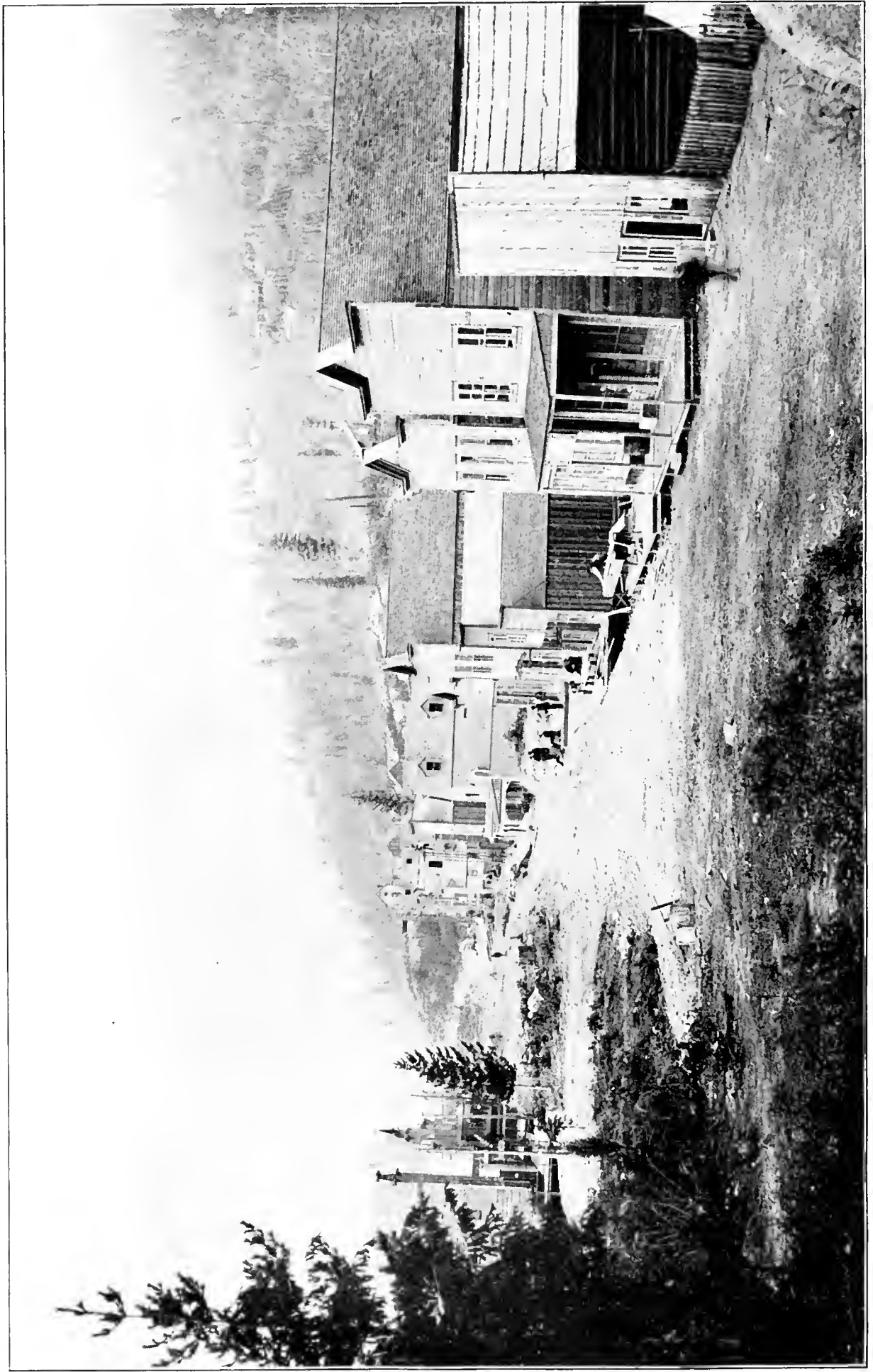
Number of Mineral Claims recorded	617
" Placer Claims recorded	8
" Certificates of Work recorded	788
" Assessments paid in money in lieu of work ..	17
" Certificates of Improvement	113
" Bills of Sale, transfers, &c	309
" Abandonments	25
" Water Grants	6
" Miners' Certificates (personal)	1,997
" " (companies)	92
" " (special)	51

The following extended extracts from the exceedingly well gotten up Report of Mr. E. B. Kirby, Manager of the War Eagle Mine, are given as furnishing an accurate account of that mine in particular, and a very fair idea of the general conditions prevailing in the Rossland Camp:—

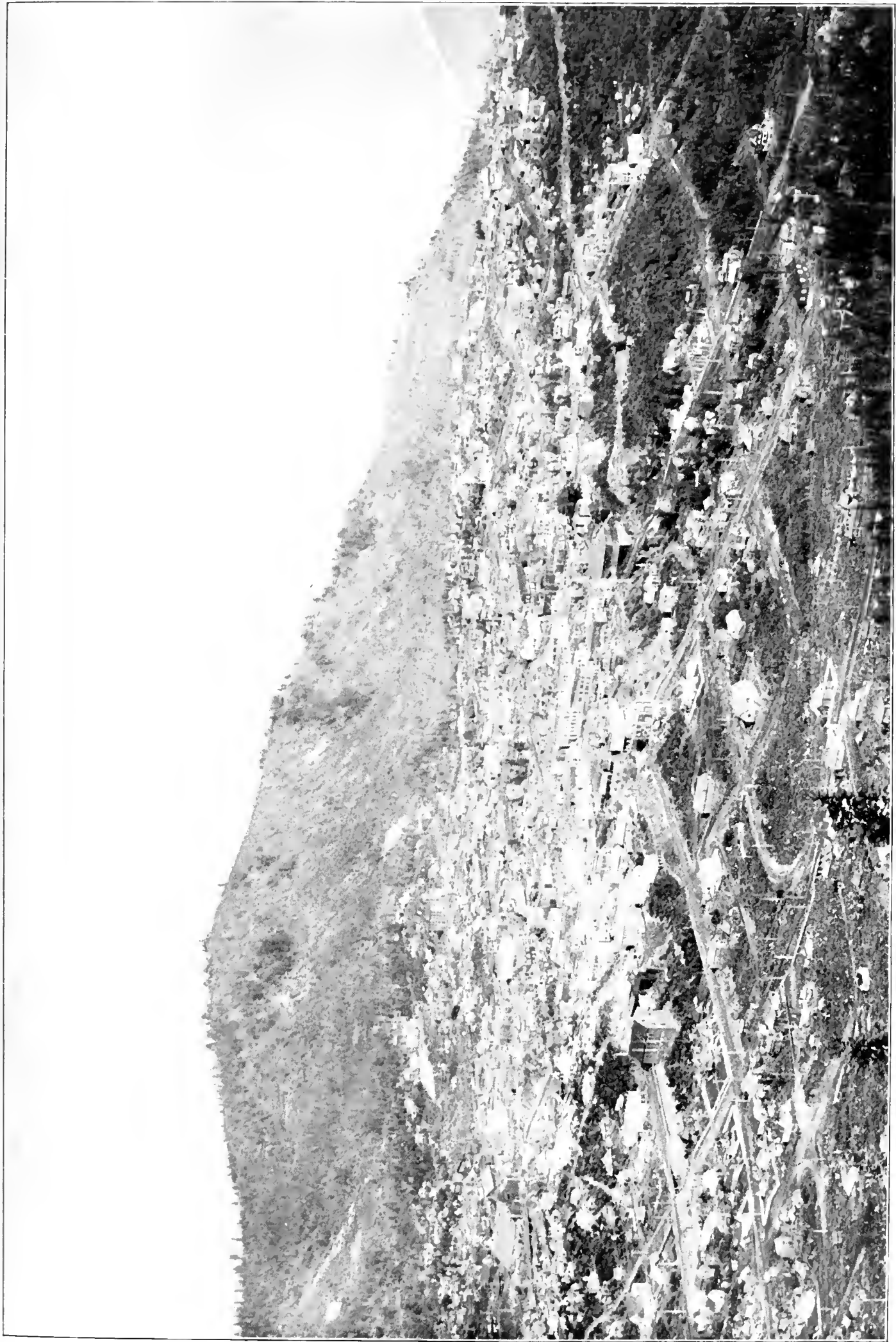
"THE WAR EAGLE MINE.

"Almost the entire production of the War Eagle Mine has been derived from its 'Main Vein' and from a single ore shoot in this vein. This shoot has a dimension of 300 to 450 feet along the vein, and has now been exposed to the sixth level, a depth of 755 feet measured on





ROSSLAND—MAIN STREET—OCTOBER, 1894.



ROSSLAND—GENERAL VIEW, OCTOBER, 1899.



the vein. It is so located that its median line roughly coincides with the line of the main shaft. As usual, the vein area included within the shoot limits carries pay ore in irregular patches or masses, interspersed with barren material or ore too low in grade for profit. The different pay ore bodies vary in grade from thirty (\$30) dollars or forty (\$40) dollars down to the pay limit. The structure is somewhat complicated by numerous dykes and faults, and by branching of the vein. Moreover, its width in places, and the irregular distribution of the pay bodies, increases the proportion of development work necessary.

“About 640 feet east of the shaft the “main vein” is crossed at an angle of 55 degrees by a smaller vein. In it an excellent ore body, apparently another ore shoot, has recently been discovered. It has a dimension along the vein of 120 feet, an average width of 11.1 feet, and has been stoped to the surface 50 feet above. This stope has yielded 5,966 tons, averaging \$23.38 per ton, smelter’s gross assay value. A winze has been sunk 60 feet in ore, but the work has not yet gone far enough to prove the limits or continuity of the ore body.

“THE MAIN ORE SHOOT.

“The proportion of pay ground within the main ore shoot is approximately shown by the following table:—

“TABLE SHOWING WIDTH OF STOPES AND PERCENTAGE OF PAY AREA IN MAIN ORE SHOOT.

“(December 31st, 1899.)

PORTION OF ORE SHOOT.	Area of Stopes. Square feet.	Stoped Area in percentage of Shoot Area. Approximate.	Average Width of Stopes. Feet.
Block above Level No. 1	37,850	78 %	5.2
“ “ 2	45,000	66 %	8.1
“ “ 3	38,480	56 %	8.3
“ “ 4	17,500	42 %	8.9
“ “ 5	12,270	37 %	13.2
“ “ 6	9,280	19 %	10.0

NOTE.—On Levels 5 and 6, the Stopes are still being extended. The first four Levels are about worked out, so that the percentages given show the total pay area.

“The following table also shows the production and grade of ore from the main shoot:—

“TABLE SHOWING PRODUCTION AND GRADE OF ORE FROM EACH LEVEL, UP TO
DECEMBER 31ST, 1899.

“(From Main Ore Shoot only.)

PORTION OF ORE SHOOT.	Net Tonnage Produced.	Smelter’s Gross Assay Value, per Ton.
Block above Level No. 1	19,601 tons.	\$24 52
“ “ 2	36,299 “	26 69
“ “ 3	31,432 “	16 67
“ “ 4	15,066 “	14 12
“ “ 5	15,004 “	15 68
“ “ 6	5,279 “	17 19
Total	122,681 tons.	\$20 48

“So far as known, the first four levels are practically worked out. There are some small remnants, and future prospecting may add something to their tonnage, but there is no reason to expect any important additions.

“The fifth level is but partly worked. It requires more development to prepare the discovered ore bodies for stoping, and there is also a possibility of discovering others. Forty feet west of the shaft the main vein splits into north and south branches, both of which carry pay ore.

“The sixth level also shows the north and south branches, both carrying pay ore. Their junction here lies east of the shaft. Between the levels the largest and richest ore mass is found along the line where the two branches join. The shoot on the sixth level is only partially developed. The developments are still opening up pay ground, and it will be some time before the shoot is well exposed so as to define the pay ore and establish its quantity and grade. It is impossible to estimate this now with any degree of accuracy, because of this lack of development, and also because of the exceptional shape and unusual variations in grade of the ore bodies in this block. It is evident, however, that the quantity of pay ore is large. There is, so far, nothing to indicate that the shoot has decreased in size at this depth. The main shaft has now reached the seventh level, at a depth of 880 feet measured on the vein. The cross-cuts to the veins will soon be under way.

“GRADE OF ORE.

“The grade of ore from the shoot is shown by the above tables, also by the accompanying statistics of yearly and monthly production. From all these data it is apparent that, with depth, the ore product has lowered in grade. It must be noted, however, that this change in product, considered only by itself, would not prove any change in the shoot. As the costs of mining and smelting decreased, the pay limit was lowered. The stopes were therefore extended to include ore of lower grade. By stoping less, the grade might have been kept higher.

“Hence, the productiveness of the shoot at various levels is measured by the quantity as well as the grade of its product. As compared with the first three levels, the fourth level block now finished showed a sudden and great decrease in both the quantity and grade of its ore. The fifth level is also less productive, but an improvement on the fourth. The sixth level is not developed enough to show its contents. It promises, however, to be more productive than the fifth. A body of fine ore was stoped, averaging about \$28, smelter's gross assay value. Patches in this ran from \$40 to \$50, which is as high as anything in the three first levels. This proves that the conditions of ore deposition here were still such as to permit the occurrence of high grade bodies. The number to be encountered is of course a matter of luck. On the whole, the decrease in productiveness for two levels is no more than might be expected from the natural fluctuations of ore shoots. So far, there is no reason to assume that the decrease is permanent. No conclusion can be drawn until the shoot is developed to greater depths.

“The fact that development work is exhausted, as explained elsewhere, makes it impossible to present any accurate estimate of ore available above the sixth level. So far as estimates can go, they indicate about 20,000 tons, with an average grade of about \$14.25, smelter's gross assay value.

“DETAILS OF DEVELOPMENT ON 5TH AND 6TH LEVELS.

“*Fifth Level.*—The fifth level east extends 180 feet east of the shaft cross-cut. On the level west the vein splits into a north and south branch at a point 40 feet west of the shaft cross-cut. On the main or south branch, the level is extended to the distance of 296 feet from shaft cross-cut. The level of the north branch is extended to a point 160 feet from the cross-cut.

"The level east exposes pay ore for the first 40 feet, and from there on is unproductive. At the 157-foot point, raise No. 552 extends 60 feet above the level. It exposes a 6 to 12-inch streak of sulphide ore of low grade.

"On the level west the pay ore continues to a point 80 feet from the shaft cross-cut. This ore, together with the 40 feet on the level east, constitutes a large body which has been stoped out above, nearly to the fourth level. This stope has an average width of 13 feet, and has yielded 17,091 tons, average \$15.32, smelter's gross assay value. The stope has not yet been exhausted. From the above-mentioned 80-foot point to the 175-foot point along the south branch, the vein shows ore in spots, but on the whole is too low grade for profit. From the 175-foot to the 245-foot point, the vein is of better grade, but still below the pay limit. The remaining 51 feet on the level is in barren ground. At the 150-foot point on this south branch, raise No. 590 extends 40 feet above the level. It is almost entirely in pay ore, of the average width of 5 feet and a grade of \$16, smelter's gross assay values. The level on the north branch has exposed pay ore for 120 feet of its length. This is $4\frac{1}{2}$ feet wide and averages \$13.20, smelter's gross assay value.

"*Sixth Level.*—The split in the vein strikes this level at a point probably 100 feet east of the shaft. On the north branch, the level is extended 110 feet east of the shaft and 120 feet west of it. At a point 15 feet west, a cross-cut, 60 feet long, gives access to the south branch. Drifting on this branch has extended 40 feet east and 30 feet west from the cross-cut.

"In the level east, on the north branch, the first 50 feet from the shaft is too low grade for consideration. From the 50 to the 90-foot point, the ore is 5 feet in width, averaging \$12.60, smelter's gross assay value. From the 90 to the 110-foot point, the ore is 20 feet in width, averaging \$16, smelter's gross assay values. At the 120-foot point, the ore is cut off by a dyke, and drifting has not yet extended farther. Raise No. 651 was started in the low grade material 40 feet east of the shaft. For the first 20 feet above the level the ore was only 6 inches wide and of little value. Above this point it rapidly widened out into a large body of high grade ore. The stope upon this body has so far produced about 8,000 tons of about \$28 per ton, smelter's gross assay value. The stope averages 11 feet in width. Raise No. 653, 75 feet east of the shaft, is now 46 feet above the level. It is in pay ore throughout showing a width of 5 feet and a smelter's gross assay value of \$20.

"In the level west, on the north branch, the ore for 100 feet averages 5 feet in width, with a smelter's gross assay value of \$13.80. From the 100-foot point to the end of the level there is no pay ore. At the 45-foot point, raise No. 686 connects with the stope above. This raise connects with the main stope at a height of 60 feet. Throughout its length, however, it is in unprofitable ground. On the south branch, the 40 feet east averages 8 feet wide at \$14.40, smelter's gross assay value. The 30 feet of west drift averages 6 feet wide, at \$10.45, smelter's gross assay value.

"THE PRESENT SITUATION.

"For reasons set forth in the following letters, it has been necessary to suspend production and cease dividends until the exhausted development is caught up and the mine and equipment are put in proper condition for economical work:—

"ROSSLAND, B.C., January 16th, 1900.

"*The War Eagle Consolidated Mining & Development Co., Limited., Toronto, Ont.*

"GENTLEMEN,—You are familiar with the details of our long struggle with delayed, inefficient, and broken-down machinery. During all this time we have managed with difficulty to maintain the minimum ore supply required by the smelter, and have thus avoided the consequences of a shut-down.

"The evils which could not be avoided, however, were the falling behind with our development work and very excessive costs of mining.

"During the past year we have stoped nearly twice as much ore but have run about half as much development work as during the preceding year. Hence, instead of gaining with development, as you originally planned to do, we have entirely exhausted it.

"The shortage of hoisting capacity and of air for the machine drills made it impossible to maintain the tonnage, and at the same time to keep up the necessary shafts, upraises, and headings.

"We have for months been running from hand to mouth.

"We cannot apply an economical system of stoping, because the ground is not properly opened out in advance. Moreover, the machine drills are so crowded together as to cause serious interference and loss of time. Ventilation and timbering cannot be properly maintained.

"We have endured these evils so far in the hope that they would be only temporary, and that it might be possible to improve the situation gradually and avoid a stoppage of production. It is now evident that this is not possible. It will be several months before the new machinery is in place, and until then we cannot gain much with the development.

"It will then be many months before this development is advanced far enough to permit economical mining. Meanwhile, the present waste of money would continue.

"Under the circumstances, radical measures are necessary to secure relief. I am, therefore, compelled to advise that you immediately stop production and cease dividends. We can then devote a number of months to the sole work of getting the mine and its equipment into proper shape for economical work.

"Respectfully yours,

"EDMUND B. KIRBY, *Manager.*

"COMPARATIVE STATEMENT OF WORK DONE AND ITS COST PER FOOT OR TON FROM JAN. 20TH, 1897, TO SEPT. 30TH, 1898.

	Jan. 20th to Sept. 30th, 1897.			Oct. 1st, 1897, to Sept. 30th, 1898.		
	Work done, Ft. or Tons.	Total Cost.	Cost per Foot or Ton.	Work done, Ft. or Tons.	Total Cost.	Cost per Foot or Ton.
Development Work.						
General Work, Stations, Re-timber'g, etc.		\$ 3,770 18			\$18,249 34	
Drifting Feet	2,303	46,313 33	\$20 11	3,480	74,958 25	\$21 54
Raising "	421	12,768 93	30 33	451	13,726 95	30 43
Sinking—Small Shafts or Winzes. "						
Sinking—Main Shaft "	175	16,150 31	92 29	185	17,808 99	96 26
Total Development Work "	2,899	\$79,002 75		4,116	\$124,743 53	
Ore Extraction.						
Ore from Development Work . . . Tons	2,596			2,316		
Ore from Dumps, Storage, etc. . . "						
Ore Stoped "	4,810	\$15,634 94	3 24	26,559	\$86,070 10	3 24
Total Ore sold "	7,406	\$15,634 94	\$2 11	28,875	\$86,070 10	\$2 98
Summary.						
Cost of Development per ton of Ore sold.	7,406	\$79,002 75	\$10 67	28,875	\$124,743 53	\$4 32
Cost of Ore Extraction " "	7,406	15,634 94	2 11	28,875	86,070 10	2 98
Total cost of Mining " "	7,406	\$94,637 69	\$12 78	28,875	\$210,813 63	\$7 30

"COMPARATIVE STATEMENT OF WORK DONE AND ITS COST PER FOOT OR TON FROM OCT. 1ST,
1898, TO DEC. 31ST, 1899.

	Oct. 1st, 1898, to Sept. 30th, 1899.			Oct. 1st, 1899, to Dec. 31st, 1899.		
	Work done, Ft. or Tons.	Total Cost.	Cost per Foot or Ton.	Work done, Ft. or Tons.	Total Cost.	Cost per Foot or Ton.
Development Work.						
General Work, Stations, Re-timber'g, etc.		\$11,830 26	.....	.....	\$ 1,897 27	.....
Drifting..... Feet ..	1,884	42,927 28	\$ 22 78	837	21,850 64	\$26 10
Raising..... " ..	417	16,169 89	38 77	253	8,495 12	33 51
Sinking—Small Shafts or Winzes. " ..	7	349 95	49 99	42	1,826 93	43 50
Sinking—Main Shaft..... " ..	122	16,283 05	132 92	70	6,897 51	98 54
Total Development Work... " ..	2,430	\$87,560 43	.....	1,202	\$40,967 47	.....
Ore Extraction.						
Ore from Development Work.... Tons ..	1,670	.....	.....	1,894	.....	.....
Ore from Dumps, Storage, etc... " ..	3,763	\$25,226 00	\$0 60	721	\$ 563 29	\$0 78
Ore Stopped..... " ..	45,810	181,224 01	3 95	20,079	77,074 18	3 84
Total Ore sold..... " ..	51,243	\$183,476 27	\$3 58	22,694	\$77,637 47	\$3 42
Summary.						
Cost of Development per ton of Ore sold.	51,243	\$ 87,560 43	\$1 71	22,694	\$40,967 47	\$1 80
Cost of Ore Extraction " " ..	51,243	183,476 27	3 58	22,694	77,637 47	3 42
Total Cost of Mining " " ..	51,243	\$271,036 70	\$5 29	22,694	\$118,604 94	\$5 22

LILLOOET DISTRICT.

REPORT BY F. SOUES, GOLD COMMISSIONER.

I have the honour to submit herewith mining and office statistics, and annual report for the District of Lillooet for the year ended 31st December, 1899.

The total ascertained yield of gold for the District for the year is \$58,590, the largest return for the past eight years, and in excess of last year's returns by \$23,078.

While the returns of the past year are still far behind the average of those of the decade ending 1889, they are in a high degree satisfactory, as the increase is due to the returns from quartz mining, from which, it may reasonably be expected, the output will be much increased in coming years. It is also the first time in the history of the District that the returns from mineral lodes have made any noteworthy addition to the general yield.

For many years past Mr. A. W. Smith, of Lillooet, has been the largest shipper of gold, bought by him from local sources; this year, however, he takes second place with \$21,700, the Ben d'Or Mines, Ltd., leading with \$22,958 from their mineral claims on Cadwallader Creek. The mining industry throughout the District, during the past season, has been quiet, with marked absence of the fevered and profitless excitement of the previous three years.

This class of mining is still very neglected, and is represented only by
Placer Mining. three mining leases and the itinerant Indian and Chinaman. These leases are those of the Lillooet Hydraulic Mining Company, near Lillooet, with a return of \$1,400, and the Dutch Hill and Derby leases at Big Bar, with returns of \$1,804 and \$1,603, respectively. A mining lease held by Mr. H. S. Southard and situated on the Fraser River nearly opposite to the Fountain, while not a producer to any extent this year, is deserving of notice, as shewing what persevering energy and skill will accomplish. The site of the lease is absolutely without water, and to work the ground by hydraulic appliances, water had to be taken from creeks on the east side of Fraser River and carried to the west side. This has been done by the construction of a suspension bridge on two steel cables, each 365 feet in length, strongly guyed at both ends to prevent swinging. The floor of the bridge is three feet wide, and the steel pipe conveying the water is enclosed in a box under the floor. The water is taken from a creek locally known as the Nine-mile Creek, which has sufficient fall and power to throw the water for hydraulic purposes a distance of 200 feet. I understand Mr. Southard is well satisfied with his prospects, and proposes constructing a similar bridge at the upper end of his lease next year, to convey water from Eleven-mile Creek. He has shown indomitable skill and perseverance in the construction of this bridge, etc., at considerable expense, and is deserving of success.

Messrs. Glen & Richardson, in the early part of the season, made every endeavour to reach bed-rock on their leased ground on the South Fork of Bridge River, but failed, through not having a pump of sufficient power.

On the other mining leases in the District no work has been done this season. A number have been cancelled, by failure on the part of the lessees to carry out the conditions of their leases, and after every indulgence had been given them.

In reporting on this class of mining, as regards Cayoosh Creek, Quartz Mining. McGillavray Creek, and Upper and Lower Bridge River and tributaries, I am wholly indebted for my information to Mr. Phair, Mining Recorder, Lillooet; Mr. DePencier, Secretary of the Alpha Bell Gold Quartz Mining Company; and to Mr. Gibbs, of Lillooet, for an excellent topographical map of the South Fork of Bridge River, Cadwallader Creek, and surrounding country, shewing the names and localities of practically the whole of the mineral claims in that section, and which I submit with this report for your information.

CAYOOSH CREEK.

The mineral claims, stamp mill and chattels of the Golden Cache Company have been purchased by the Toronto and Lillooet Gold Reefs Company, which has also purchased three other mineral claims, adjoining the others and lower down the creek. This new company, with Colonel Rives as superintendent, is now busily engaged in the erection of a dry crushing roller mill, said to be the largest of its kind in the Province, and equal to treating 50 tons of ore per day. The ore in the three claims purchased by the Company is said to be arsenical iron sulphide carrying gold, and will be treated by the cyanide process. Fifty men are employed at present, nearly the whole of the machinery and material is now on the ground, and the mill is expected to be running by May, 1900. The motive power to run the machinery will be compressed air, carried through a 4-inch pipe. The Company proposes continuing the tunnel on the *Golden Cache* Mine, and also other development work on that property. It has been to a very large preliminary expense to practically test on a large scale by the cyanide process the value of the arsenical ores on this creek, and I am only voicing the wish of the entire community when I say that I sincerely trust they will have most satisfactory results.

With the exception of development sufficient to obtain certificates of work on a few claims on this creek, nothing else has been done in the past year.

MCGILLAVRAY CREEK.

A high grade of free gold-bearing ore has been met with on the *Brett Group* of claims on this creek, and arrangements have been made for the erection of a 20-stamp mill on the property. A portion of the machinery has arrived, and no efforts will be spared to have it erected and ready for work early next season. A considerable amount of development work has been done on two claims of the group, including fully 300 feet of tunnelling, and there are now over 1,000 tons of milling ore on the dump. A number of claims are located on this creek, but, with the exception of the above, development has been purely superficial.

On the *Gilfoil* claims, on Seaton Lake, a tunnel has been run, which now is in about 140 feet. The ore in these claims carries copper and gold.

BLACKWATER.

At least 30 claims were located in this camp in 1896, but they appear to have been abandoned this year. This is to be regretted, as nothing worthy of the name of development has been done on any of them, and it is a portion of the District that is well worthy of the careful attention of the prospector. It is true that it is somewhat isolated, but it is not nearly as difficult of access as other portions of the District.

BRIDGE RIVER.

On the South Fork of Bridge River and on Cadwallader Creek there have been between 80 and 100 mineral claims located. On a large number of these development work has been done. The principal group of claims now being worked is that owned by the Ben d'Or Mines Company, situate at the junction of the North and South Forks of Cadwallader Creek,

on which a ten-stamp mill has been in operation during the past season, with satisfactory and encouraging results. The difficulties and obstacles which this Company had to contend with in transporting the heavy machinery some 60 miles from Seaton Lake, over a rough trail and partially frozen river, can only be realised by those engaged in the work. In mining and milling, the Company employs 30 men.

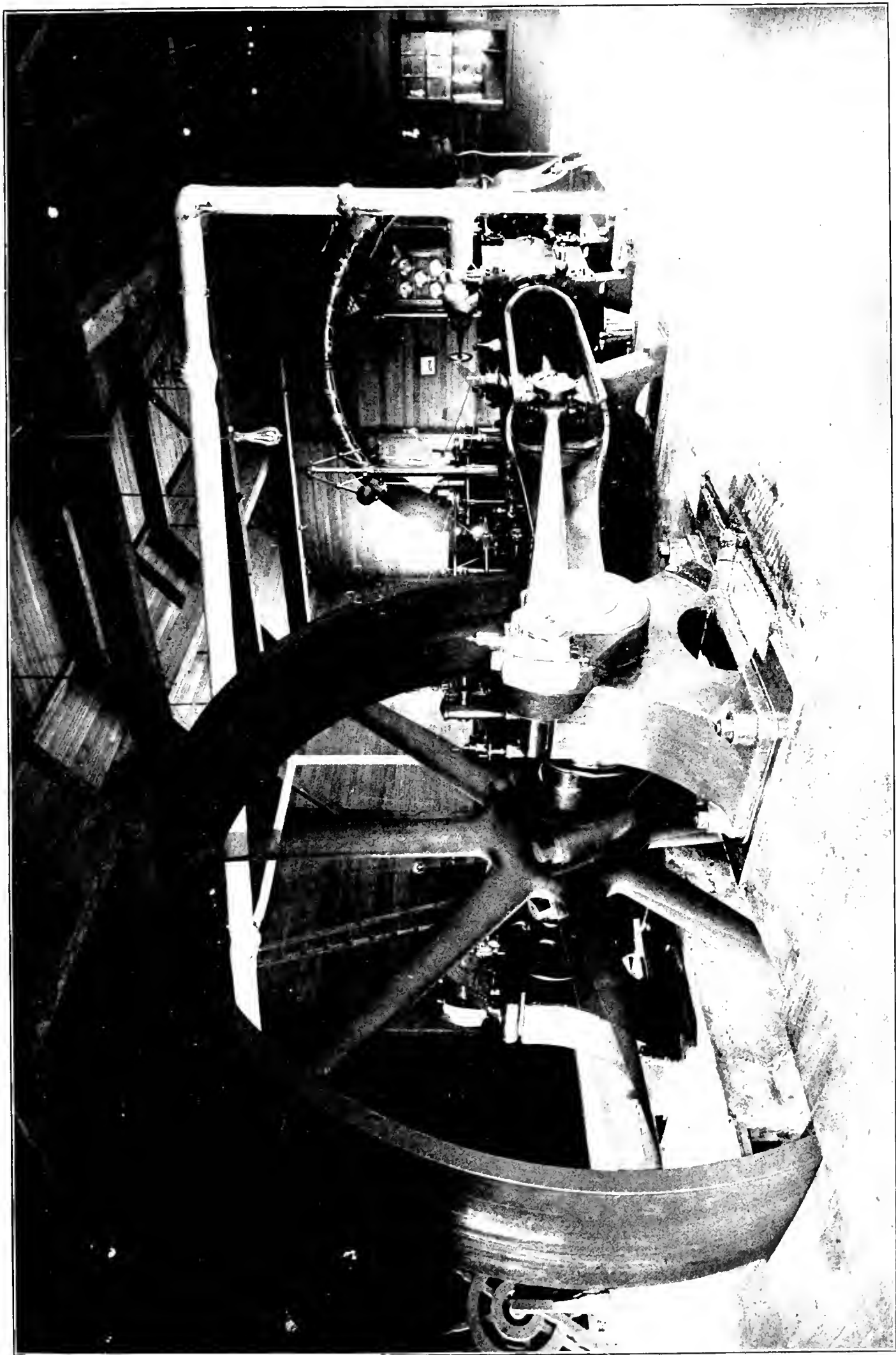
The *Lorne Group* is situated lower down on Cadwallader Creek. The ore from one of the claims in this group was worked by the primitive arrastra, five men being employed, and \$6,000 realised in 76 working days. It is intended to put a small stamp-mill on the property this spring. There are three ledges showing free gold on the claims, on one of which a shaft has been sunk to a depth of 75 feet. On the *Woodchuck* claim, adjoining the former group, an arrastra is being built to treat ore from a continuation of one of the *Lorne* ledges, said to be rich in free gold. There are excellent showings on a number of other claims in the neighbourhood, notably on the *Pioneer*, *Forty Thieves Group*, etc. The ore in all the claims on the South Fork and Cadwallader Creek is said to be free-milling. The completion of a waggon road from Lytton to Lillooet has materially shortened the distance from the railway to the latter point but, until a road is constructed from Seaton Lake to the South Fork and tributaries, mining operations requiring heavy machinery will be seriously handicapped.

Another group of claims adjoining and immediately below the *Ben d'Or* consists of the *Ida May*, *Trio*, and *Mary* and *Nellie* fractions, and is owned by the Alpha Bell Gold Quartz Mining Company. Crown grants have been issued for these claims. A great amount of development work, in the form of tunnels, drifts, etc., has been done on this property, and the Company proposes resuming active operations early in the spring.

I have in former reports referred to the fact that this part of the District has never been visited by any of our eminent geologists, which, in my opinion, is much to be regretted. In a general and superficial way, the geological formation in the neighbourhood of the South Fork of Bridge River, Cadwallader and Sucker Creeks may be described as alternating bands of granite, slate and diorite. The South Fork and Cadwallader Creek, where the greater number of the claims are located, run through the slate formation. For the following topographical description I am indebted to Mr. S. Gibbs, of Lillooet, who writes:—

“For miles and miles the country is covered with a whitish yellow dust. In places there is at least a foot in depth of this overlying gravel and boulders, which in turn overlies hardpan and cement. The valley of Sucker Creek, which is about three miles from Cadwallader Creek, has never been thoroughly prospected. In the excitement of 1897 a number of claims were located there, but I know of none on which work has been done. The distance from the mining lease at the mouth of the South Branch to the *Wild Elephant* claims on Cadwallader Creek is fully eleven miles. There were a number of claims located on the south bank of the South Fork and Cadwallader Creek in 1897, and some work was done on some of them. The owners lacked heart, however, and nearly all have now lapsed. The banks on that side are very precipitous, rising to a range of granite mountains. Mount Hamilton, which lies between the South Fork and the main Bridge River, is, in my opinion, the extinct volcano which poured out on this section all the volcanic dust before referred to. On the south side, the density of the timber and rough nature of the country, no doubt, has disheartened the prospector from even a partial examination. On the north banks there is hardly any timber fit for mining purposes, nothing but small, dead black pine, brush, etc.; prospecting is difficult, but not nearly so bad as on the south side. I most sincerely wish that we could get a good geologist to spend a summer in this section. I am sure he would find it full of interest.”

From the foregoing account it is evident that there is as yet but very little known, either from the geologist's or miner's point of view, of a very extensive portion of the



BLACK BEAR COMPRESSOR—LE ROI MINE, ROSSLAND, B. C.



District. Some fifty odd miles down the Bridge River, at Horseshoe Bend, a number of mining leases are situated, on which, I am advised, active operations will be commenced next season. Several mineral locations have also been made in this neighbourhood, but I am without information regarding them. On the North Fork of Bridge River the *Maid of England Group* of mineral claims is situated. The owners have spent the season in development. The ore is principally copper, and it is the intention to ship a few tons to the Tacoma smelter for a milling test. Development work was continued during the season on one claim on the Bonaparte River. Nearly the whole of the locations made in that neighbourhood in 1897 have been abandoned without any attempt at development. The B. C. Development Co.'s group of claims (12), for which the Company holds Crown grants, and on which a great deal of work has been done, have been at a standstill during the year. The same remarks apply to the mineral claims on the Big Slide.

Of the claims referred to in last year's Report as situated at the base of the Marble Mountains, ten miles west of Clinton, development work has been continuous on some, but the majority have lapsed. At Dog Creek work has been continuous in tunnelling on two claims there. On the locations on Mahood Lake and Clearwater River some development work was done early in the season.

Of minerals of commercial value I have nothing new to report. The ledge of sulphide of antimony on Cadwallader Creek has had nothing done on it during the year. On the Natron Lakes, north of Clinton, sufficient work has been done to obtain the annual certificates.

I regret to say this class of mining is still in a very unsatisfactory stage in this District. Innumerable obstacles are in the way; primarily, the great cost of a suitable dredger of sufficient strength to stand the wear and tear of the powerful current of the Fraser River. Then the seasons are all short and uncertain. In some places it is possible to commence work in the middle of February, but with the probability of being stopped by extreme cold in March. Then comes high water in early June, and for at least a month or six weeks no vessel can live out in the current and floating drift. True, they may haul into the eddies and continue work safely there, but the débris in these eddies may be entirely barren. After high water there may be a steady run until the middle of November, when cold weather again intervenes, and it pays best then to haul in shore and make secure for the winter.

I think it may be safely conceded that every portion of the bed of Fraser River is not gold-bearing. The so-called bars, or, more properly, exposed portions of the bed of the river at low water, were thoroughly denuded of their auriferous wealth by the miners in the early days of mining in this Province. The margins of every one of these exposed portions are annually subjected to close scrutiny by the itinerant Indian and Chinaman. Seasons are never alike; some years, on account of the water not falling low enough in the early spring, the returns are next to nothing, while, occasionally, there is very low water in early spring, and the returns are good. It should also be borne in mind that there are jagged and corrugated stratas of various primary rocks crossing the river at all angles, and these may be very rich in gold, but it is beyond the recovery powers of any dredger. There are also wide bands of smooth hard cemented gravel of unknown depths, which may be accepted as barren. Another thing which I would draw attention to is the want of continuity in gravels holding paying gold. A striking example of this occurred on that part of the river at Big Bar being worked by the New Fraser River Gold Mines Co. In December, 1898, work was closed down on good paying ground, and the position marked carefully with bearings on both banks. Work was resumed practically on the same spot last spring, and after a week's steady run the returns were next to nothing. It seems to me that a "prospector" should be a part of the outfit of every

dredger. By this I mean something after the form of a core drill, which could be worked continuously ahead or alongside. A core drill would bring up sufficient of the débris to prove whether it would pay to dredge, and could be worked by the motive power of the dredge machinery. My idea may be impracticable, but it seems that if something of this nature could be adopted it would save a very great deal of unnecessary work. The dredger on Big Bar closed down early in the season, and I am without information as to the future intentions of the Company owning it. The Dominion Gold Dredging Co.'s dredge at Horsebeef Bar, below Lillooet, worked a few weeks, but, from various defects in the machinery, work was stopped early in the season without any returns

The Cobeldick Dredging Co. has under construction near Lytton a very powerful and costly dredger, which, I understand, will operate on some leases in this District, probably next season.

With the two exceptions mentioned, no work has been done on the other dredging leaseholds this year.

A limited quantity of lignite from the Hat Creek deposits is raised annually for local purposes. On the North Thompson prospecting is still being carried on, but I have no information as to the results.

In conclusion, I may add that the outlook for the coming year is at present much brighter, and especially in quartz mining, than it has been for the past eight years.

OFFICE STATISTICS, LILLOOET DISTRICT.

Mineral Claims	recorded	155
Placer " "	"	11
Conveyances	"	77
Certificates of Work	"	158
Abandonments	"	2
Certificates of Improvement	"	15
Placer Claims re-recorded		3
Water Grants recorded		5
Dredging Leases in force		19
Mining " "	"	41
Free Miners' Certificates, Revenue	\$1,223	80
Mining Receipts, general	3,112	25
Mineral Tax	132	67

YALE DISTRICT.

REPORT BY G. C. TUNSTALL, GOLD COMMISSIONER.

I am pleased to state that the mining operations of the past year in the Similkameen and Kamloops Mining Divisions have been productive of renewed confidence in the mineral deposits. Assessment work has been diligently performed on the various locations, some of which already exhibit indications of becoming valuable properties.

New mineral areas are being constantly discovered and every succeeding year brings to light ore bodies where the presence of metalliferous veins was previously unknown. The large bodies of mineral in the southern portion of the District, which are at present attracting so much attention, creating towns and sustaining a considerable population even at their present stage of development, apparently lie in a mineral belt that has been traced through the Similkameen and Nicola Valleys to the Thompson River at Kamloops.

KAMLOOPS MINING DIVISION.

The mines in the Kamloops Division are becoming of more importance as development progresses. So far but little outside capital has been invested. This may be principally attributed to the large sums demanded for mining property. Operations have been diligently carried on on the principal claims, and prospecting has been more active than in former years. The expense incurred by poor men in working their properties is, in many instances, a heavy burden, which only unimpaired confidence in the value of their holdings can justify.

The number of certificates of work recorded in the Mining Recorder's Office show an increase of one-half more than in the preceding year, and the revenue from mining sources has also increased to the extent of 50 per cent. over that of 1898. These are gratifying proofs of the permanence and value of the mineral deposits.

Since my last report, new discoveries of importance have been made at Harper's Camp, on the South Thompson River, about 10 miles west of Kamloops; at Lewis Creek, a tributary of the North Thompson River; and at Ten-mile Creek, about four miles south of Mamette Lake.

COAL HILL CAMP.

The Coal Hill Camp is the most important in this Division, embracing the largest number of locations, and being further advanced in development it naturally attracts more attention. The ore is principally chalcopyrite of low grade, but is found in large bodies containing from 2 to 5 per cent. copper, and from \$1 to \$4 in gold to the ton, and is, generally speaking, capable of concentration. This great advantage enables those mines which possess a large quantity of ore that, as it is, would be of too poor a character to pay transportation and charges for smelting, to be placed on a paying basis.

Development has been steadily prosecuted on the *Pothook*, *Python*, *Charlotte*, and *Copper King*, with good success.

The *Kimberly Group* of claims lies at the eastern extremity of Coal Hill, about four miles south of Kamloops. It embraces seven locations.

The principal work has been done on the *Charlotte*, and consists of a tunnel 225 feet in length, and a shaft 18 feet deep, besides numerous cross-cuts. The shaft has been sunk on the vein. The lode which can be traced for about 4,000 feet, has a width of 40 feet, as proved by cross-cuts, and is probably even wider. This mine is at present being actively developed by its owners, Messrs. Fowler and Carter, who have assiduously worked the property, encouraged by full knowledge of its value.

The *Hecla Group* lies west of the *Kimberly*, and has a shaft sunk and timbered for a depth of 30 feet. A shaft-house, blacksmith shop, and boarding house are at present being erected. It is the intention of the owners to sink to a depth of 75 feet and cross-cut from wall to wall.

This group lies to the north of the *Hecla Group*, and contains five claims. The formation and vein-matter are different from that encountered in the two groups previously mentioned, being porphyry and diorite, carrying copper glance. Work to the value of \$500 has been performed on these locations in the shape of holes and cross-cuts.

This mine was actively developed, with a force of eight men, the greater part of last summer. The results in every particular have come up to expectations. The shaft is 100 feet deep, and a drift from it has intersected a body of vein-matter without reaching the opposite wall. The ore is of a concentrating nature. A second open cut has exposed a vein-cropping with altered rock. A carload of ore was shipped late in the fall, which is stated to have returned a yield of 8 per cent. copper and \$4.50 in gold to the ton. Could this shipment have been concentrated at the mine, the returns would have been exceedingly profitable. The intention is to build a concentrator next summer, by which time a large quantity of ore will be blocked out. The *Python* lode is supposed to run for a long distance along the southern slope of Coal Hill, and is thought to have been opened in the *Charlotte* claim, nearly two miles distant, where it again presents the appearance of a large low grade copper deposit. Among the improvements effected are a waggon road from the foot of the hill to the mine, an excellent house, affording comfortable accommodation for the men, and a tramway and ore bin.

The *Pothook* mine has a double compartment shaft $4\frac{1}{2}$ by 5 feet, sunk a depth of 330 feet. At the 75-foot level a drift has been run 40 feet in a southerly direction. At a depth of 150 feet a drift was run to the south for 243 feet. At the same level a cross-cut was driven to the north-east for a distance of 214 feet, which intersects a body of low grade ore. At the 240-foot level a drift was run to the south for 320 feet, through ore. At the bottom of the shaft a drift 84 feet long is in a body of low-grade ore. An order for more powerful machinery has been given, the present hoisting power being inadequate to meet requirements.

This group embraces five claims, viz.: *Truth*, *Dakota*, *Hope*, *Jennie* and *Pearl* mineral claims. They are situated about six miles south-west of Kamloops. Most of the development has been done on the *Truth*, and consists of a shaft 45 feet deep, through copper ore. This is considered one of the most promising properties on Coal Hill.

The Erin. Assessment work has been recorded in favour of this mine for a period of several years. It is the intention of the owners to resume work shortly.

Iron Mask. The necessary papers have been forwarded for a Crown grant in favour of this location. The large amount asked has deterred capitalists from purchasing this property.

Owned by Messrs. Batchelor, Ford, Macdonald and Robinson, lies **Noonday Group**, about $4\frac{1}{2}$ miles south-east of Kamloops. Three men worked all the summer on this claim. Development includes an incline shaft 100 feet deep; a drift at the 50-foot level extending 50 feet on the lode; one from the bottom of the shaft, also intersecting the vein, and a cross-cut 30 feet long. This work has proved the vein to be very strong. The vein-matter is quartz, showing free gold in two pay streaks, respectively 18 and 6 inches wide.

Evening Star. On this claim there are two open cuts, two shafts and one tunnel. The open cuts are 100 feet long; the tunnel is 20 feet long, and the shafts are 20 feet and 12 feet deep, respectively.

Bill Nye has three open cuts which aggregate 50 feet long, and a tunnel 60 feet in length. The ore is chalcopyrite.

Blue Bird. This property has two shafts, respectively 14 and 17 feet deep, and an open cut 50 feet long, 4 feet deep. The ore is chalcopyrite. This and the two foregoing properties show up remarkably well.

The *O. K. Group* is situated about midway between the *Iron Mask* and *Python*. It numbers three claims, the *O. K.*, *Iron Chancellor* and *Prince Charles*. On the first-mentioned work has been systematically prosecuted, and consists of a well-timbered shaft sunk to a depth of 60 feet, at which level cross-cuts have been driven some 30 feet east and west. The entire work is in vein-matter, which is a medium-grained, dark green rock, granitic in structure. The ore occurs in bunches and streaks throughout, and is chiefly a chalcopyrite. In the west cut a promising body of chrysocolla was encountered, development of which may add to the value of the property. The vein is in the strike of the *Iron Mask*, and is probably the same as that of the latter.

Iron Chancellor. A tunnel has been run to prospect a body of magnetite, in which, before the tunnel was discontinued, were found several stringers of copper pyrites in a 30-foot vein. A considerable amount of surface work has been done, and all necessary buildings have been erected on the ground.

Golden Chest. This property is situated about three miles south-west of the town of Kamloops. Several good outcrops of copper show up in this claim, but insufficient work has been done to determine their value.

Wheal Tamar. O. S. Batchelor and Boillot Bros., of Paris, owners. This claim has been worked by two men most of last summer. Ninety feet of shafts, and numerous cross-cuts, indicate that the property may develop into a mine. Some high assays have been obtained, and a large body of ore, carrying 3 per cent. copper and \$2 in gold, has been exposed.

Is situated about seven miles south of Kamloops. It embraces the **Navy Group**. *Cyclone*, *Admiral Dewey*, *Black Beauty*, *Sampson* and *Schley*. The first mentioned has a tunnel 84 feet long, showing mineral all the way; also two open cuts intersecting good ore bodies. The *Admiral Dewey* has an open cut 40 feet long, and a tunnel which extends 50 feet. These disclose bodies of ore.

On the *Black Beauty* a shaft has been sunk 12 feet deep, and several cross-cuts have been made on the *Sampson* and *Schley*, all showing up large bodies of chalcopyrites.

Grass Roots is situated one-half mile east of Jacko Lake. The country rock is diorite cutting porphyry, carrying traces of gold. The diorite is traversed by a number of small veins of magnetite, associated with copper pyrites. This mineralized zone covers a width of 200 feet. Many open cuts have been made, exposing this belt of mineral, and a trial shaft has

been sunk to a depth of 14 feet on a vein of calcite, magnetite and copper pyrites. The veins vary from a few inches to 24 inches in width. The samples of ore from this shaft are the prettiest found in the camp.

Possun and *Elsie* are claims adjoining the *Grass Roots*. They are situated near Jacko Lake, on an iron capping in which copper pyrites is freely disseminated. The capping shows a width of from 6 to 20 feet. There are several open cuts and three small shafts sunk, the deepest being on the *Elsie*—20 feet.

Fragment. This a fractional claim adjoining the *Iron Cap*, and possesses the same characteristics.

The work done consists of three open cuts in a gulch, exposing stringers, averaging 6 inches in width, of pyritous rock, carrying gold values and some copper carbonates.

Golden Star mineral claim, situated on the same lode as the *Evening Star*. It has two veins. The character of the ore is chalcopyrite and copper glance. Three shafts have been sunk from 12 to 25 feet deep; one tunnel, 86 feet long, and two cross-cuts, 30 feet long, 5 feet deep.

Saucy Lass mineral claim adjoins the *Kimberly Group*. A good deal of open cut work has been done, and two small shafts sunk at the bottom of a gulch, which were subsequently filled in by wash from the hills in the spring. A vein of magnetite has been exposed possessing a width of 6 feet.

Chieftain Group. This group is situated on Sugar Loaf Mountain, seven miles southwest from Kamloops. The principal claim is the *Chieftain*. It contains several veins. The work last summer was restricted to open cuts and drifts. The vein-matter is quartz, containing copper pyrites. The formation is diorite.

Green Cub appertains to the *Chieftain Group*. The work done consists of open cuts, exposing the continuation of the *Chieftain* vein, which exhibits a width of 2 feet.

Mollie Gibson is situated on Jamieson Creek, about half a mile from the mouth. It adjoins the *Homestake*. The ledge is auriferous quartz from 5 to 6 feet wide. This claim has been bonded to Hope, Graveley & Co., for English capitalists.

The *Homestake*, on Jamieson Creek, has 5 pits from 8 to 10 feet deep. The ledge is from 2 to 10 feet wide, containing quartz carrying iron pyrites, zinc and galena, and having values in gold and silver.

Night Hawk. O. S. Batchelor and J. C. McLaren, owners. A tunnel has been run 50 feet on the vein, which is quartz, containing sulphides of iron and some galena. This property is under bond to G. F. Monckton, for English capitalists.

Harper's Camp Group, South Thompson River, consists of five claims, as follows:—*Gordon*, *Pauper*, *Cedar*, *Pine* and *Fir*. Most of the work has been done on the *Gordon*. The vein-matter is quartz, carrying iron pyrites. Development effected last summer includes a shaft 52 feet deep, and a drift 18 feet long across the vein. Some fifteen open cuts have been made, exposing the ledge for a distance of 1,500 feet.

This group is about 12 miles east of Kamloops. Six other locations in the vicinity have been recorded.

Hill Top is the property of Boillot Bros., of Paris, France. It is located on the west side of the North Thompson River, about 4 miles in a north-westerly direction from Kamloops. Two men have worked on it for the past three months. The ore is quartz and sulphides of iron.

Princess Alice, Lewis Creek. This claim is situated on the north-east slope of the mountain range near the source of Lewis Creek, about 30 miles from Kamloops. A cut has been made, exposing the vein at a depth of 30 feet from the surface. The lode is about one foot on the surface, and at the bottom of the cuts extends to 22 inches.

CHERRY CREEK.

The work done on this property is represented by a tunnel and open
Copper King. cuts 470 feet long. Some 16 feet of concentrating ore was intersected by the tunnel. Seven men were employed during the summer, and work is still being actively prosecuted. The ore contains copper pyrites and bornite.

Shipped 400 tons of magnetite ore to the Trail smelter to be used as a
Glen Iron Mines, flux. The veins vary from 10 to 20 feet in width. The mine is situated close to the Canadian Pacific Railway track. There is a chute 300 feet long, and an aerial wire tramway 1,300 feet in length, capable of delivering 100 tons in 10 hours to the cars.

Pole Star is situated on the southern slope of a mountain, 3 miles west of the Thompson River. The lode walls are quartz porphyry. The vein is 8 feet wide at the surface, containing irregular stringers heavily mineralized with galena. An incline shaft has been sunk in the vein along the foot wall to a depth of 26 feet.

Consists of four locations, situated on a mountain range between
Salmon Arm Moose Lake and Canoe Creek. The *Lily Dale* and *Treadwell* are the
Group principal claims. The lode is about 40 feet wide, containing white mineralized quartz, carrying copper, gold and silver. The formation is slate and granite. Most of the work has been done on the *Lily Dale*, which has an open cut 40 feet long, 7 feet deep, and a shaft 6 by 8, 15 feet deep.

GRAND PRAIRIE.

The *Key* claim has an open cut 13 feet long and about 8 feet deep.
The Key. The vein-matter is quartz and quartzite, covered with iron capping, and carries silver.

Forest Queen. Work has been done on two veins, one of which is 7 feet wide, containing granite and quartz, and carrying gold and silver.

Alice Hay has a vein of chalcopyrite which yields good assays. The lode is 6 feet wide. An incline shaft has been sunk in a deposit of molybdenite and copper ore.

Henrietta. Several open cuts have been made, exposing the vein extending through the *Alice Hay*, and exhibiting the same kind of ore.

Nelson. A ledge 10 feet wide runs through this claim. The ore possesses values in gold, copper and molybdenite.

Embraces the *Iron Cap*, *Bonanza* and *Hope*. The *Iron Cap* has an
Salmon River open cut and tunnel 43 feet long. The vein is 23 feet wide, between
Group porphyry walls. The assay value is \$9.40 in gold. The *Hope* has three parallel veins. A small open cut exposes the same ore as that in the *Iron Cap*. The *Bonanza* is situated on a porphyry dyke, has a shaft 10 feet deep in quartz, and an open cut along the lode. The iron capping on this location is about 100 feet wide.

The *Silver Scepter* is a recent find of great importance. It is situated
Silver Scepter. about three miles south of Salmon Arm. The vein runs east and west. The work, so far, has exposed a width of 12 feet, without reaching the opposite wall. The ore is argentiferous galena. Samples taken from a seam of clean galena,

15 inches wide, assayed \$165 to the ton. This discovery has caused a great deal of excitement, and a number of claims are being staked for record. The lode cuts through the formation at right angles to the line of cleavage, and is considered a true fissure.

NICOLA VALLEY AND SURROUNDING COUNTRY.

The Nicola Valley gives every promise of becoming an important mining centre. The construction of the Columbia and Western Railway will open up one of the most attractive sections of the Province of British Columbia, noted for its salubrious climate, and possessed of a beautiful park-like country, that will not cease to be of interest to the seeker after health or pleasure. It extends south from the mouth of Campbell Creek, above Kamloops, to Spence's Bridge, a distance of about 110 miles, and has communication by stage twice a week. The settlers are in a prosperous condition, and have pleasant homes, provided with every necessary comfort. Lateral spurs of the Gold Range extend on each side of this lovely valley, and present picturesque views of grassy slopes, sparsely covered with timber. The only place of any importance is Nicola, which is situated at the foot of Nicola Lake, a splendid stretch of water 18 miles long. Nicola is the distributing point for the Similkameen Mines, with which it is placed in communication by an excellent waggon road. The stage leaves here for Granite Creek, Princeton and intermediate points every Friday, and returns on Monday evening.

The first mineral discoveries in this vicinity were made on Mill Creek in 1897, a few miles behind the town. These exhibited some rich peacock copper ore. Most of the deposits seem to be entirely copper-bearing, and are found over a large area. In the past, the holding of most of the claims by parties who are unable to develop them, and the distance from railway communication, has, in a great measure, prevented the investment of capital. More prospecting was done last season than in former years.

TEN-MILE CREEK.

On Ten-mile Creek, about five miles south of Mamette Lake, a dyke of granite, impregnated with native copper and cuprite, was discovered last summer. The *King Solomon* and *Midnight* claims were staked off and immediately bonded. Other properties west of the above have been opened up to a limited extent, with very satisfactory results.

The small amount of work effected on the *Aberdeen* has invested it with the features of a prospective mine. At a depth of a few feet, copper carbonates and iron were disclosed. The width of the vein is at present unknown, but it will probably exceed 20 feet.

The *Mountain View* and *Plymouth Queen* lie parallel to the *Aberdeen*, and have veins carrying bornite and grey copper.

At Quilchena, some very good locations have been staked. The ore is copper, in a quartz gangue, carrying higher values than usual. More work is necessary to determine their value.

The claims on Mill Creek will soon be in a position to offer inducements for the erection of a concentrating plant.

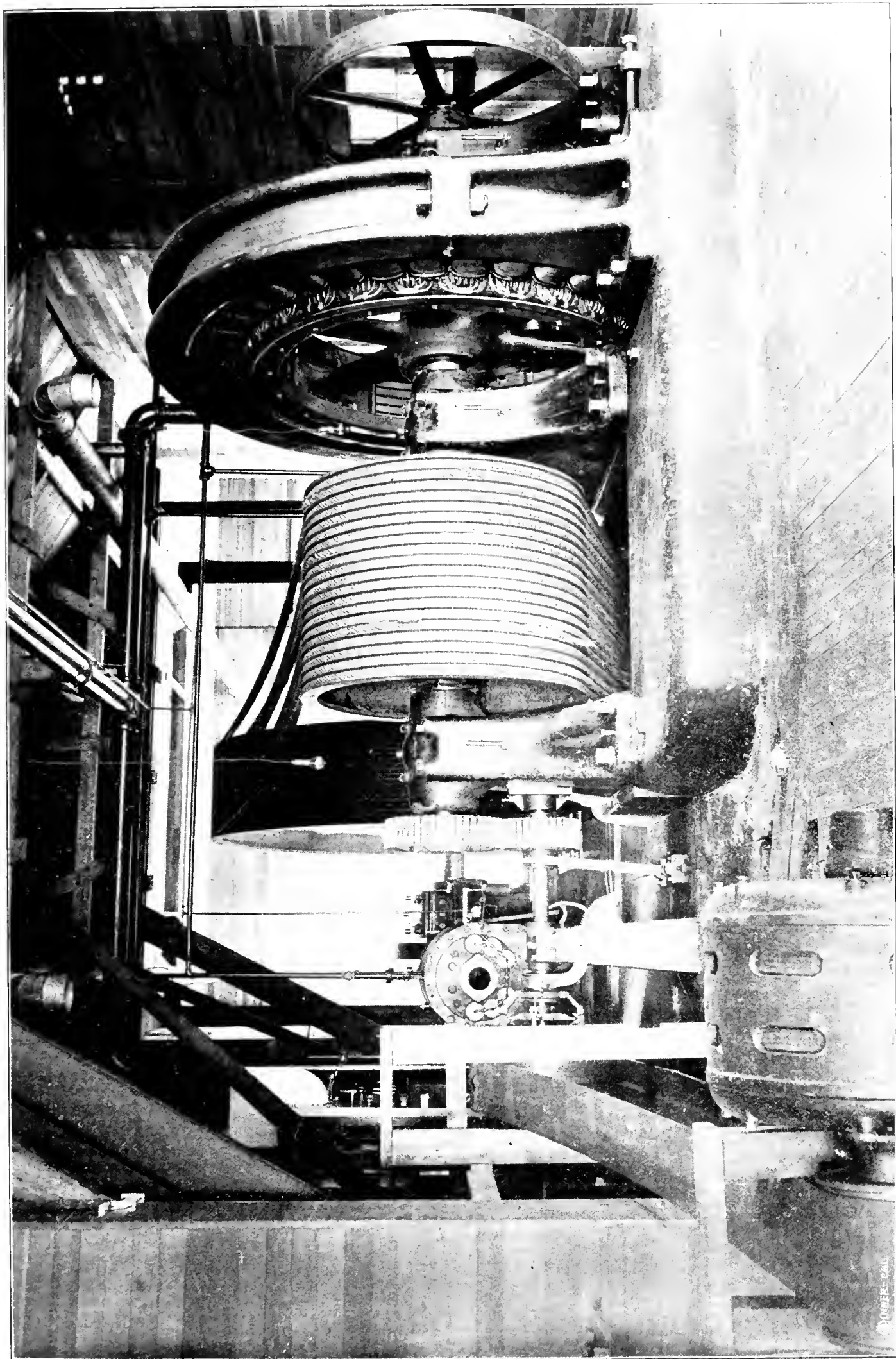
The *Empire No. 2* has a vein 3 feet 6 inches wide, containing copper sulphides in quartz, with small gold and silver values.

Work has also been steadily prosecuted on several adjacent properties. The *Humming Bird* has an open cut, 50 feet long, exposing copper sulphides in close contact with magnetite.

Mining operations will be actively carried on next summer.

SAVONA AND SURROUNDING COUNTRY.

I take great pleasure in forwarding a report on the mines at Savona and surrounding country, made by Mr. A. J. Colquhoun, the well-known mining engineer, who is thoroughly conversant with that section of the country.



ELECTRIC MOTOR DRIVING AIR COMPRESSOR—WAR EAGLE MINE, ROSSLAND.

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PLACER MINES.

Placer mining in the Kamloops Division exhibits signs of attaining more importance than in former years. Next summer will probably see the first dredges operating on the Thompson and North Thompson rivers. The Horseshoe bend in the former river, below Deadman's Creek, comprising $1\frac{1}{2}$ miles, has been leased to Mr. Satchell Clarke, a dredge-master of long experience in New Zealand, who has made arrangements for the construction of a dredge to be operated next season.

Mr. C. D. Christie, of Nelson, has a lease of the river, extending down stream $1\frac{1}{2}$ miles from the mouth of Jamieson Creek.

On the Mitchell mining leasehold, Jamieson Creek, work was prosecuted the greater portion of the summer. The high bed-rock was worked in the Sixties, and yielded good returns, but all attempts to reach the bottom of the creek failed. On this ground a shaft was sunk to a depth of 80 feet, when a heavy flow of water was encountered and put a stop to further operations. I understand it is the intention to attempt another shaft higher up the creek, where it is supposed less difficulty will be experienced in attaining the object sought.

Mr. H. R. Bellamy, a mining engineer, and his associates, have obtained leases embracing Skull Creek and benches in the vicinity bordering on the North Thompson River, also five miles of the river, which was prospected last summer with such satisfactory results as to leave little doubt that it can be profitably worked. Mr. Bellamy exhibits a number of samples of gold obtained from the different localities which received his attention. That from the creek was of a coarse nature. At my request, he has made a report on the auriferous gravels of the North Thompson, which I forward herewith.

NOTES ON AURIFEROUS GRAVELS OF THE NORTH THOMPSON RIVER.

COMMUNICATED BY MR. H. R. BELLAMY, OF NELSON, B.C.

"In laying before you my views on the North Thompson River as a gold-producing stream, and the advantages it offers for dredging, it will be necessary for me to dwell at some length on the surface formation of the surrounding country, and in entering upon this subject I beg leave to be allowed to deal with a somewhat large area of alluvial gravels tributary to this stream.

"Much has been said on gold-bearing placers in different parts of the world by eminent men, but we are still left in the dark as to where the gold originates from. The mother lode has not yet been found, and what I might have to say on this line would, I fear, not throw much more light on the subject. Accordingly, I will not try to carry your thoughts back further than to the old conglomerate gravels, from which, I believe, a great deal of the present gold found in the different streams has originated.

"Take, if you please, a point at the east end of Kamloops Lake, and follow an imaginary line north to the foot of the Cariboo range of mountains, north-east of Barkerville. In traversing this line, you would meet, at different intervals, large bodies of those ancient conglomerates towering up, in places, from 200 to 300 feet above the present water level of the same localities.

"Much of this ancient formation is still in its original place, as left there by water action, and has become conglomerated by the cement qualities found in its make-up. At the time of

its deposit, water must have flowed at a much higher level than now, and in its constant receding to the present levels of our rivers it has brought down immense quantities of decomposed conglomerates from these higher levels.

“At the head-waters of Jamieson Creek, which flows into the Thompson River, there is a large quantity of the old conglomerates to be found. These I tested for gold, and in almost every instance I found colours.

“In comparing the gravels found at this point with those along the Quesnelle River, in the Cariboo District, there is no conceivable difference found. The same old cements are found adhering to the rocks, which shows that at one period that country contained much of these old conglomerates.

“If you revert to the imaginary line running north, you will find, by reference to the map, that it runs nearly on the highest peaks of the mountains which lie between the Thompson River and the Bonaparte River, forming a watershed between the eastern streams flowing into the Thompson, and the western streams flowing into the Bonaparte and Fraser Rivers.

“In calling your attention so fully to the surface of the country tributary to the Thompson River, and especially that lying to the west, my object has been to show the reasons why I believe that much gold exists in the bed of the Thompson. I believe that all the streams from the west, flowing into the North Thompson River, have brought down more or less gold, especially the Clearwater River, which connects with the Thompson some 90 miles from Kamloops, and which rises in the Cariboo District some 10 miles from Quesnelle Lake.

“This river has no doubt brought down vast quantities of gold and deposited it along the bed of the Thompson. The current of the Clearwater is quite swift until it connects with the Thompson, which flows through a comparatively level valley as far as Kamloops. Accordingly, its current is very slow, except in places where the river becomes very shallow on account of the discharge of boulders from the various creeks feeding into it, which causes, at places, small rapids, such as the Fish Trap Rapids.

“I estimate that the current in the North Thompson does not exceed two miles per hour at its ordinary stage of water, and as its gravels are not of a coarse grade it will be readily seen that dredges can work to good advantage when sufficient values are met with. In my work during the past Summer and Fall, I found no portion of the gravels that I tested but what will pay handsome profits when the proper improved dredges are put to work.

“The gold is of a fine character, but will not be difficult to save, owing to its cleanness. I have estimated the black sand to be one per cent. of the entire fill, and it carries values in gold ranging from \$23 to \$32 per ton after amalgamation.

“There are several other streams, flowing into the Thompson from the east, that are said to carry gold, but as I have not had an opportunity to test them I am not able to verify the reports.

“The waggon roads up the North Thompson Valley are in good condition, affording excellent facilities for moving machinery.”

The following special report on the mineral properties on Criss Creek, and in the neighbourhood of Savonas, has kindly been sent me by Mr. A. J. Colquhoun:—

“CRISS CREEK.

“Considerable work has been carried out at Skomahis (Indian word signifying an open place or clearing), a new camp on Criss Creek, 25 miles from Savonas. Work has been done

on the *Mersey* and *Humber*, where veins of quartz carrying galena, blende and copper occur in heavily mineralized talcose schist. Several of these veins occur on the *Mersey*, two and three feet wide, and a number of open cuts have been made. A tunnel has been carried 12 feet on one vein, which shows oxidized quartz, carrying in places where it is less decomposed about 15 % galena, and averaging 2 feet wide. Work at this point has hitherto been costly, as it was necessary to commence work in a narrow canyon, and the camp is 10 miles from a road. Assays run over \$10 in the precious metals, besides the copper and lead contents. Only sufficient work has been done on the *Humber* to prove the continuity of the veins.

“*Afton*. Very little work has been done. The rocks are conglomerates, talcose schists, and granite. The first of these preponderate on the top of the hill, but thin out lower down, being apparently old channels in the talcose rocks. The granites are intrusive. There are several large bodies of quartz on the claim, carrying large quantities of arsenical pyrites. The veins on the *Mersey* should be found on the *Afton* with a little prospecting work.

“COPPER CREEK.

“During the past year great activity has been shown in the development of the quick-silver and copper deposits of this locality, attended with good results, as evidenced by the shipments of ore to the smelter.

“About \$5,000 has been spent in development work, and two shifts are at present being worked on the *El Progreso* and *Tenderfoot*, at Copper Creek.

“The portion of the district carrying copper ores lies immediately east of Copper Creek, and includes Lookout Point, 850 feet above the lake. Its extent is about one square mile. The ore occurs on the contact of porphyry and basalt, the basalt also being an ore bearer.

“*El Progreso*, *Newark*, *Sunlight* and *Stirling*, the property of the Copper Creek Development Syndicate, situated on Copper Creek, about 500 feet above the lake, have been well exploited this year, as the following work shows:—

“*El Progreso*. A tunnel 55 feet long has been driven on the vein, approached by an open cut for 30 feet. At the mouth of the drift is a shaft 21 feet deep, from the bottom of which a cross-cut is driven west for a distance of 8 feet. The deposit disclosed is a contact of basalt and porphyry. The total width is unknown, the east wall not having been found. Assays of the different classes of ore give as follows:—

“A. Copper, 5%. Gold, \$8 per ton.

“B. Copper, 1%. Gold, \$9. ”

“*Newark*, *Sunlight* and *Stirling*. These claims present a good showing for the amount of work done, consisting of open cuts and prospect holes.

“*Last Chance* and *Caledonia*. These properties adjoin one another. The latter is the property from which it is supposed came the copper, the abundance of which caused the Indians to call the locality Copper Creek. Even in recent days great quantities of native copper have been worked out of the gulch below it. The work done here shows a dyke carrying small plates and scales of native copper. It has been very badly developed, and the hole made is unsafe. The copper occurs mostly in streaks along the junction of this dyke and the enclosing rocks.

“*Last Chance*. The main work has been done on a quartz vein, which lies horizontal, or nearly so, and averages in width from 4 inches to 2 feet. The vein has been exposed by this work for about 100 feet, and contains chalcopyrite, associated with molybdenite and iron pyrites.

“*El Ultimo*. This claim adjoins the *Progreso* on the east. Assessment work only has been done so far. This shows a porphyry dyke seamed with quartz and calcite, carrying copper as bornite, which has been exposed for a distance of over 50 feet, and appears to be at least six feet wide.

“The ore carries about 4 % copper, $\frac{1}{2}$ dwt. of gold, and 2 oz. of silver.

“*Tenderfoot Mine*. Work is being pushed ahead steadily, with two shifts of men running a tunnel to tap the main deposit. A shipment of 4 tons was made during the year to the smelter, giving results as follows:—Gold, .16 oz.; silver, 7.5 oz.; copper, 21.97 %. A company is now handling the concern, and with the fine showing and ore of the above values, this property should become a producer. Considerable work has already been done, consisting of incline shaft 43 feet and tunnel 30 feet, from foot of incline shaft to the south; also 23-foot shaft and numerous open cuts.

“The *Trent* claim is situated on the north side of Kamloops Lake, opposite Cherry Creek, and resembles the *Copper King*, being in the same area of diorite. A cut 20 feet by 5 feet has been sunk 8 feet, showing a streak of ore running 9 % copper, and one 2 feet wide which yields 1 %. There are also several outcrops of low grade copper deposits on the claim.

“The adjoining claim, the *Shannon*, has been opened up by a small drift and open cuts, exposing a streak of good ore.

“HARDIE MOUNTAIN CINNABAR COMPANY.

“The properties of this Company are situated in the quicksilver zone, and are extensions of the Cinnabar Mining Company’s deposits, which are situated at the mouth of Copper Creek. The ore occurs disseminated in dolomite, and in an altered rock which appears to be volcanic ash; also in rich stringers traversing these. The general direction of the dykes in which these deposits occur is north and south. About \$3,000 has been spent on the group of claims owned by the Company, this year. The principal work is a tunnel driven on the *Caledonia* for a distance of 235 feet, exposing an immense body of low grade furnace ore, averaging 1 to $1\frac{1}{2}$ %, besides rich streaks of ore which will go as high as 60 % and over. One hundred and eight feet of open cutting has exposed some very fine ore bodies on the other properties.

“MAMETTE LAKE.

“Copper occurs west of Mamette Lake, about 5 miles from the waggon road and 28 miles from Savonas, a station on the C. P. R., in the contact of amygdaloidal basalt and porphyry, irregularly disseminated through the rock.

“*Grey Eagle, Eagle King and North Star*. Most of the work has been done on the *Grey Eagle*, as follows:—A tunnel driven 50 feet, and 214 feet of open cuts to prospect the deposit. The group was bonded to the Hall Mines Company, and the work conducted by Mr. Fleetwood Wells, their representative. A shipment of over 7 tons was made, giving a yield of 11.7 % copper; gold, $2\frac{1}{2}$ dwts.; silver, 7 oz. per ton, but owing to the great distance from transportation and the expense of making roads, work has been suspended for the present.

“*Cowboy, Blue Jay, Mamette and War Eagle*. These properties have been prospected by means of trenching and open cuts to the extent of 300 feet, but enough work has not been done to form any idea of their worth.

“*Toonkwa*. Little work has been done on this claim. The cinnabar here occurs in a dolomite dyke of great width, and contains numerous stringers of high grade ore through the rock.”

OFFICE STATISTICS—KAMLOOPS DIVISION.

Free miners' certificates	364 = \$2,035 55
Locations recorded	380
Records of assessment work	347
Bills of sale recorded	118
· Mining leases issued	9
General mining receipts	\$4,302 50
	\$6,338 05

SIMILKAMEEN MINING DIVISION.

REPORT BY G. C. TUNSTALL, GOLD COMMISSIONER.

In the Similkameen Division, Copper Mountain, Kennedy Mountain and Twenty-Mile Creek are some of the localities destined to become camps of importance when the approaching construction of the Columbia and Western Railway shall supply the necessary transportation facilities, and open up a large extent of beautiful country, whose resources have lain idle, and been comparatively unknown, for lack of communication.

The projected railway, as at present located, proceeds through the Similkameen Valley to near Princeton, and, diverging at Graveyard Creek, follows the old trail, known as Allison's trail, to the north fork of the Otter River; thence in a northerly direction it proceeds to Quilchena, in the Nicola Valley, and from that point to Spence's Bridge, where it connects with the Canadian Pacific Railway. This route passes within easy reach of the principal mines lying between Princeton and Lower Nicola, and only a short distance from the *Big Sioux Group*, which contains some of the richest copper ore discovered in this Division; it also traverses the coal measures known to extend for several miles through the valley, the coals of which are of excellent quality and capable of being made into good coke.

The decreased yield of alluvial gold is noticeable. Notwithstanding
Placer Mining. that the past season proved unfavourable for mining operations, it marks the exhaustion of the placer mines in a section of country which has been industriously mined since 1860, and employed hundreds of men in years gone by. This is a matter of deep regret, for here, as elsewhere throughout the Province, it brought into existence a class of men, fast passing away, notable for self-reliance, rugged endurance, and sterling worth—in periods of prosperity reckless and prodigal, but possessed of a generous disposition which never failed to succor the distressed and unfortunate. These men were the pioneers of civilization in the remote wilds they inhabited. Their lives are closely associated with the early history of this country, on which they have left a deep impress that the coming years will not obliterate.

Most of the benches bordering on the streams, which have hitherto been the main source of supply of gold, are still available, but the expense entailed in constructing ditches to work them is a great and, in many instances, insuperable obstacle to their development.

Fifteen miles of the Similkameen and Tulameen Rivers have been leased to the Messrs. Waterman and Hall, who have since transferred their rights to the Vermilion Forks Mining and Development Co. Tests of alluvial gravel from these streams have revealed the fact that the black sand found in these river beds contains a quantity of fine platinum which, in addition to the gold that will be obtained, may prove profitable to work with dredges.

The following is a short statement of the particulars relating to each claim mentioned:—

GRANITE CREEK.

The Boston and British Columbia Mining Co. has been prospecting some ground at the mouth of Granite Creek, endeavouring to reach bed-rock. With the assistance of a thirty-horse power engine and pump, a depth of thirty feet was reached, but the amount of water encountered will necessitate the addition of another pump next spring, when operations will be renewed with increased activity. This property includes the old *Mainland* claim, which gave excellent returns in the early days, and possesses an ancient channel of Granite Creek which at one time took an abrupt turn at this point and proceeded through the *Mainland* flat to the Tulameen River. Attempts to bottom this deep channel proved abortive with the crude appliances formerly in use.

The *Pogue* ground is situated on the east bank of the creek, some distance above the town of Granite Creek, and has been, with the intermission of a few years, continuously worked since its first location in 1885. During that period it has yielded a large amount of gold by drifting. Last season the Company was engaged stripping and ground sluicing. There is still a large extent of auriferous gravel left, which can only be made profitable by hydraulicing.

The foregoing represents all the placer mining on Granite Creek the past season, with the exception of work done by a few Chinese. The heavy rains last summer were productive of freshets, which greatly interfered with working the placers, and consequently reduced the yield of gold.

SLATE CREEK.

The Slate Creek Mining Company owns several leases on the creek of that name, and one on the Tulameen River. Mr. Alexander Swan is the manager.

This creek paid well in the early days. The pay streak was followed into deep ground formed by a wall of rock, which dammed the channel and greatly increased the depth of alluvial drift, which, combined with a heavy flow of water, baffled all attempts to reach the bottom, and finally led to the creek being abandoned. Since then it lay idle for a number of years, until the present Company was formed. A good deal of prospecting then ensued, without any results of a favourable character. This led to tests being made in other portions of the ground for the outlet of the old channel on the Tulameen River. Numerous holes were made in the face of the bench fronting on the river, and at last an immense body of auriferous gravel was found, yielding excellent prospects in gold and fine platinum. Steps were immediately taken for working the property by hydraulic power. In a short time the construction of a large ditch was under way, which has since been completed, and the pipes and monitor belonging to the Tulameen Improvement Mining Company were purchased and placed in position, and are ready for work in the spring.

BEAR CREEK.

A few Chinese were engaged in mining near the mouth of this creek last summer.

The property held by this Company is situated on the South Fork of the Similkameen. Work was started last spring, but the dam was carried away, and further work ceased for a time. The damage was subsequently repaired, and some mining was accomplished last Fall.

SIMILKAMEEN RIVER.

A large number of Chinese were engaged on this river and its tributaries last season.

COPPER MOUNTAIN.

Sunset Mineral Claim Was the first mineral claim located on Copper Mountain, and was recorded by R. A. Brown. It is now held by an incorporated company. Work was resumed about the middle of last October, and the shaft increased a depth of 10 feet. The company then installed a steam hoisting plant, and built commodious buildings, including boarding, bunk, and shaft houses. Steam drills are to be immediately brought into use, and work will be pushed with the most modern appliances.

Copper Farm Group. The *Copper Farm Group* embraces the *Copper Farm*, *Helen H. Gardner*, *Humboldt*, and *Vancouver* mineral claims. A considerable amount of money was spent on these properties the past year. The ore is of the same character as that in the *Sunset*.

Kenly Mineral Claim. Waterman & Hall, proprietors. A tunnel has been run a considerable distance, and a shaft sunk 16 feet. The formation is porphyry.

Jubilee, *Home Rule*, and *Vancouver No. 2* belong to the Vermilion Forks Mining Co. The work done consists of an open cut, in rock, 7 feet deep, 5 feet wide, and 35 feet long; country rock, porphyry; assays range from 5 to 10 per cent. in copper and \$2 in gold to the ton.

Sunrise. E. E. Burr, owner. Has a shaft 6 by 4 feet, 18 feet deep; country rock, diorite. The ore assays in gold and copper.

Honeysuckle. Owned by Day Bros. *et al.* Open cut, 12 feet deep, 5 feet wide, 30 feet long; country rock, diorite; assay yield, 4½ per cent. copper and from 85 cents to \$1.65 in gold.

Oriole. Owned by Snowdon & Co., has a shaft, 35 feet deep; also open cut, 30 feet in length; formation, diorite; assay value, copper and \$2.50 in gold.

Tin Cup, *Snowflake*, and *Little Gem* are held by Day Bros. The work consists of a shaft, 20 feet deep, and an open cut, 21 feet long; country rock, diorite; assay value, 3 per cent. copper.

Jennie Silkman. Proprietors, French & Co. Hole, 5 by 6 feet, 9 feet deep, and open cut, 20 feet long.

Triangle Fraction. William Thomas, owner. Lode, 5 feet wide, so far as known; formation, diorite; assays go as high as 15 per cent. copper.

Copper King, *Copper Reef*, and *Copper Bench.* Owned by C. E. Thomas & Co. Assays in copper and gold.

Princess May. C. E. Powell, proprietor. Assays in copper and gold.

KENNEDY MOUNTAIN.

Copper King. Charles Bonnevier & Co., proprietors. Shaft, 15 feet deep, and a hole 7 feet deep; assays in gold and copper.

Big Hump. Edward Watson & Co., owners. Three open cuts, two 8 by 12 feet, 15 feet long, and one 6 by 10 feet, 10 feet long; width of lode, 6 to 8 feet, carrying bornite and iron; sample assays go as high as 27 per cent. copper and \$10 in gold to the ton.

Red Buck. Owned by Messrs. Revely & Allison, has 30 feet of ore in sight in a formation of diorite; assays 8 per cent. copper and \$6 in gold.

ROCHE RIVER.

Gold Crown. Owned by C. Bonnevier. Open cut, 9 feet wide, 10 feet deep, 25 feet long; tunnel, 10 feet long; assays from picked samples as high as \$450 to the ton in gold.

20-MILE CREEK (SIMILKAMEEN).

The *Nickel Plate Group* is owned by M. K. Rogers, and is situated near 20-Mile Creek. There are eight claims, which adjoin the above claim. Over \$25,000 was spent on this group last summer. The ore contains gold, a percentage of which is of a free-milling character and the remainder capable of being concentrated. Work has been started on the main tunnel to tap the ore bodies.

I. X. L., Copper Chief and Tzar claims are owned by Messrs. Cahill and Yates. A tunnel 40 feet long has been run. The vein varies from 6 inches to 6 feet. Assay value, \$20 gold and copper to the ton. The country rock is porphyry.

Rollo, War Horse, Kingston and King Mineral Claims. Peter Scott, proprietor. Tunnels and open cuts, costing \$2,500, represent the work done last summer.

Windfall, Morning, Big Horn, Alpine, Paris and New York Mineral Claims. Cahill and Pickard, owners. Assessment work has been done on these claims. A tunnel 23 feet long has been run in ore, besides numerous prospect holes and open cuts. Samples assay 3 per cent. copper, \$6 in gold, and 4 oz. silver to the ton. Country rock, porphyry.

Mound and Copper Cleft. Williams & Johnson, proprietors. Two assessments have been done on these properties. Work performed consists of a shaft and an open cut.

Horsefly, Iron Duke and Exchange Fraction. Wollaston & Arundell, owners. Assessment work performed.

SIXTEEN-MILE CREEK (SIMILKAMEEN RIVER).

Two Brothers, owned by Francisco Tesu. Tunnel in rock 50 feet long. Assay values in gold and silver.

ASHNOLA CREEK.

Lucky Strike, Silver Tip and Baltimore Belle Mineral Claims Collis & Stewart, owners. Open cut in rock; tunnel 30 feet long; country rock, porphyry and diorite; width of vein, 3 feet; nature of ore, galena.

SUMMIT CAMP (HEAD-WATERS OF THE TULAMEEN).

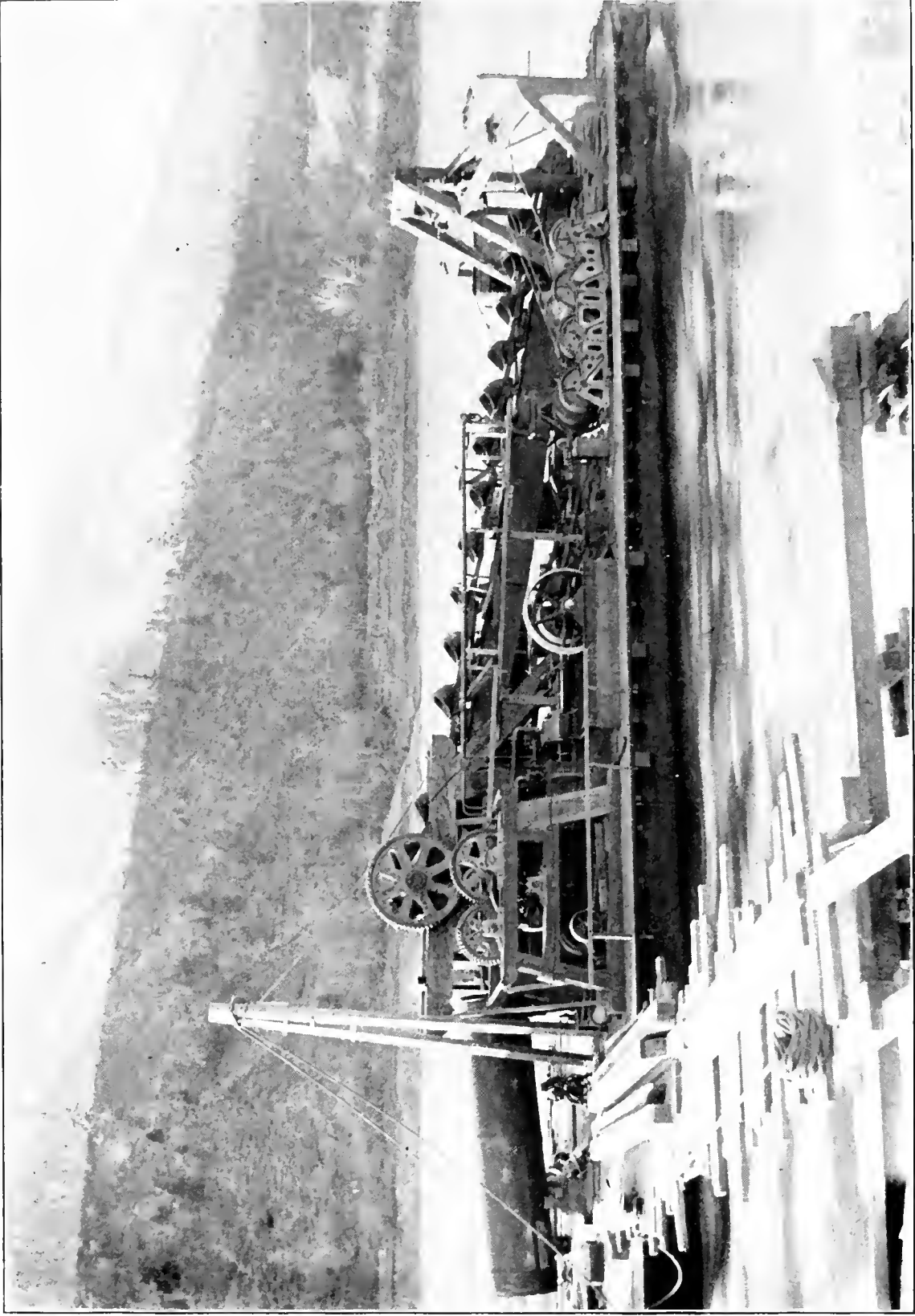
The Summit Camp, on the divide between Hope and the headwaters of the Tulameen River, embraces some claims very rich in silver, which have only lately come into prominence.

Sutter, Skyline, Lulu and Vigo Mineral Claims. Owned by an Indian Company. Nature of ore, galena; country rock, limestone. Specimen assays reach 200 oz. silver, from \$4 to \$6 in gold, 60 % lead, and 3 % copper to the ton.

Summit No. 1 and Summit No. 2 mineral claims are respectively owned by Frank Lambert and Robert Stevenson. The ore is of the same character as the above.

The principal claim in this group is the *Big Sioux*, discovered last spring by A. Schmidt, of North Dakota. It is about 18 miles from Nicola, and about 2½ miles east of the Nicola-Granite Creek road, and within a short distance of the located line of the Columbia & Western Railway. This is the most valuable discovery made the past year. The ore is grey copper, of which a large body exists in a diorite formation. Assays taken from surface rock give a value of 17 % copper and \$4 in silver to the ton.

The *Cincinnati* mineral claim lies about two miles from the *Big Sioux*, in a southerly direction. The work done consists of open cuts for a distance of 600 feet, showing ore the whole distance. The width of the deposit has not been determined. Country rock, diorite;



COBELDICK DREDGE NO. 1—IN COURSE OF CONSTRUCTION—FRASER RIVER, LYTTON, B. C.



nature of ore, grey copper, with some native copper. The assays from samples of grey copper ore indicate a value of 9 % copper and \$1.20 in silver. Five open cuts and holes have been made as follows :—

- No. 1—6 feet wide, 10 feet deep, 20 feet long.
 " 2—Hole, 4 by 5 feet, 8 feet deep.
 " 3— " 5 by 6 " 11 "
 " 4—Open cut, 8 feet wide, 12 feet deep, 28 feet long.
 " 5—Hole, 4 by 8 feet, 8 feet deep.

Between the *Big Sioux* and the *Cincinnati* a number of claims have been located, on which little work has been accomplished. Most of the claims in this belt show grey copper.

BOULDER CREEK

Is a tributary of Otter Lake, and is situated about 10 miles from Granite Creek. In the "eighties" it was industriously worked by the Chinese for gold. Some of the ore bodies near this creek can be traced for a width of 75 feet. The deposits contain gold and copper. The locations are five in number.

OFFICE STATISTICS—SIMILKAMEEN DIVISION.

Mining leases	11
Free miners' certificates issued.....	229 = \$1,097 00
Location records	690
Certificates of work	211
Conveyances.....	185
Mining receipts general	\$5,718 35
	\$6,815 35

YALE MINING DIVISION.

REPORT BY G. C. TUNSTALL, GOLD COMMISSIONER.

About the middle of this season the Ashcroft Mining Division was created, chiefly out of the territory previously included in this Division, and, consequently, this report only covers that portion now left in the Division.

PLACER MINING.

The Dewdney Syndicate is building an extensive ditch and flume, about seven miles west of Yale, for hydraulic operations next spring.

The Ottawa Hydraulic Mining Co., at North Bend, was actively engaged the past season from about the 1st of April to 30th June, when work was suspended, owing to the scarcity of water.

Wadleigh & Co. were engaged the past year erecting a saw-mill, driving a tunnel, laying flumes, iron pipes, &c., on Siwash Creek, in readiness for next season.

DREDGING.

The Fraser River Consolidated Gold Co. has operated on the bars of the Fraser River, between Ruby Creek and Hope, with a powerful dredge on the suction pump principle, which, so far, has not been successful. Alterations will shortly be made, by the substitution of buckets for the present system.

The Yale Dredging Co., Yale, has just completed the hull of its large dredge, 80 feet long, 40 feet wide, which is to be provided with a dipper capable of lifting 100 yards of gravel per hour. Mechanics from the Marion Steam Shovel Works, Ohio, are placing the machinery in position. The Company purposes operating on Hill's Bar.

The Beatty Dredging Co. has been working the past season near North Bend, with profitable results.

Altogether, upwards of \$100,000 has been invested in dredging plants in this Division, which amount will be largely increased the coming year. About 100 Chinese were engaged between Agassiz and Keefer's. Ten companies were working with sluices, the others with rockers in a desultory manner. Judging from the output of gold, their earnings have been small, no doubt owing to the high state of the Fraser River.

MINERAL CLAIMS.

The *St. Elmo*, one of the *King Group* of mines, has been developed by open cuts and shaft, with encouraging prospects.

The McKay-Murphy Co. has opened up and continued a rock tunnel under the C. P. R. track, near Hope, with a view of tapping the ledge.

SIWASH CREEK.

The property of the Gold Queen Mining Co., the *Montrose* and other locations, have had the annual assessment work performed.

SALMON RIVER (NEAR KEEFER'S).

Work has been effected on the *Allan*, *Gisby* and *Hannah* locations, and prospects are favourable.

OFFICE STATISTICS—YALE DIVISION.

Free miners' certificates.....	40 = \$119 75
Records of assessment work	13
Placer claims recorded.....	30
Placer leases	6
Transfers	28
Mining receipts general.....	\$523 10
	\$642 85

The estimated yield of gold for 1899 is \$26,208.

The above returns are for a period of six months, the Yale Office having been closed during a half-year and transferred to Ashcroft. In addition to this, a large extent of country formerly belonging to the Yale Division is now embraced in the Ashcroft Mining Division, with a Mining Recorder's Office established in that town. This change has, consequently, materially altered the revenue formerly obtained and the volume of business transacted in the Yale Office, which seem small compared with former years.

I regret to say I have been unable to obtain any information concerning the mines in the Ashcroft Division, yield of gold, and office statistics for the past year.

ASHCROFT MINING DIVISION.

The Ashcroft Mining Division is a new Division that was created in September, 1899, and comprises territory which had previously been included chiefly in the Yale and Kamloops Mining Divisions.

The report of the Mining Recorder of this Division is very indefinite, and is therefore omitted.

It would appear therefrom, however, that "none of the mineral claims are shippers, and are only prospects."

In this Division are quite long stretches of the Fraser and Thompson Rivers which are now receiving a good deal of attention as dredging propositions.

Probably the most extensive preparations for this class of work have been made by the Cobeldick Dredging Co., of Lytton, which is to operate in the Fraser just below the junction of the Thompson as soon as the dredging plant now in course of construction is completed, as it is expected to be this coming spring.

Quite a little placer work is carried on in the bed of the river, on the bars exposed by low water, but only when the water in the river is low can this work be prosecuted.

Some idea of the importance of the Division as a producer of placer gold may be gained from the amount of gold dust bought by the merchants of Lytton and Ashcroft, which is reported by the Mining Recorder as being \$16,048 and \$32,465, respectively, for the year 1899.

OFFICE STATISTICS—ASHCROFT DIVISION.

Free Miners' Certificates issued	161	amounting to	\$1,040 68
Mining Leases	"	"	2,372 50
Certificates of Work	13	"	32 50
Mineral Locations recorded	15	"	37 50
Placer	3	"	7 50
Sundry Receipts		"	513 00
			\$4,003 68

 VERNON DISTRICT.

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 VERNON MINING DIVISION.

REPORT BY L. NORRIS, GOLD COMMISSIONER.

I have the honour to report a fairly flourishing condition of the mining industry in this District. Not only have a large number of new claims of great promise been staked, but the results attending the development work on the older claims are most satisfactory.

The following are some of the better known claims, with particulars showing the amount of work done on each:—

Situated between the Arm and Head of Okanagan Lake, opposite **Densy Group**, Okanagan Landing, on the S. & O. Railway, consists of the *Densy*, *Empress*, *Golden Sunbeam* and *Rainbow* claims. The first three are staked along three narrow veins of milky-white quartz in a schistose formation, free of sulphides, and carrying gold, assaying about \$20 per ton. On the *Densy*, a tunnel 130 feet long has been driven. On the *Empress* there is a shaft 22 feet, and on the *Golden Sunbeam* there are three shafts of about 10 feet each. The *Rainbow* is staked on a contact vein, between blue granite and granite and hornblende, six feet in width, carrying values in copper and gold.

East of the *Densy Group* is the *Three Tramps Group*, running from **Three Tramps**. near the water's edge to the top of the ridge, about 600 feet high, and includes the *Three Tramps*, *Gambler* and *Rex*, very promising claims. The surface rock of the *Three Tramps* is not very rich; mostly copper stained material, decomposed, and containing some iron and copper sulphides, but at a depth of 35 feet copper ore of good grade was discovered, while on the *Rex*, at a depth of 22 feet, a banded quartz lead was uncovered, assaying well in free gold. The owners are H. Seydel *et al.* On the *Three Tramps* there is a shaft 35 feet deep, and on the *Gambler* and *Rex* there are shafts 22 and 26 feet respectively.

Owned by L. Goodchap *et al.*, is made up of the *Klondyke*, *Victor* and **Klondyke Group**, *Mountain Maid* mineral claims, and is situated on White Man's Creek, about three miles from the west shore of Okanagan Lake, with a well-defined ledge running through the three claims. The vein is about three feet wide, and lies between limestone and porphyry, carrying copper and gold values. The work on this group consists of one shaft, 50 feet deep; one shaft, 8 feet deep, and 300 feet of open cuts.

The *I. O. U.*, *Gem*, *Buckthorn* and *Copper Queen*, on Siwash Creek, 16 miles from Vernon, owned by H. Cameron *et al.*, are staked on a 6-foot ledge, lying between lime and porphyry, carrying copper and gold values.

The *Little Duncan* and the *Panorama* are two claims on Deep Creek, and about 4 miles from Okanagan Landing, staked on a vein of white quartz from 2 to 5 feet wide, carrying white iron and galena.

On the *Little Duncan* there is a shaft, 35 feet, and a tunnel, 50 feet; values in gold and silver.

On the *Panorama* there is an open cut, 12 feet, and a tunnel, 12 feet long; values are in gold and silver, with traces of copper.

The *Grand Times* and *Hidden Treasure* are a couple of claims owned by G. W. Howe, of San Francisco. They lie on Six-mile Creek, and contain a vein of free-milling quartz. A tunnel of 180 feet has been run on the *Grand Times*.

The *Peoitch* claim lies 13 miles west from Vernon. Shaft, 8 feet; tunnel, 60 feet; open cut, 25 feet; values in gold, showing also some galena and copper. The vein-matter is white and black spar about 4 feet in width, carrying iron pyrites.

The *May* mineral claim lies 13 miles west of Vernon, near Round Lake. Shaft, 8 feet; tunnel, 25 feet; open cut, 20 feet; values in gold, silver and lead, in a vein of white quartz.

The *Blue Jay*, situated $1\frac{1}{2}$ miles north-west from Vernon. Development work consists of a shaft, 44 feet deep, a tunnel, 175 feet, at the 100-foot level, tapping the ledge and 35 feet along the ledge, and an open cut of 30 feet. The vein is quartz, 4 feet wide, carrying chiefly arsenical iron, with some galena near the surface, and occasionally a little grey copper. The clay gouge on hanging wall is $\frac{1}{2}$ to 1 inch thick, without a break as far down as developed (100 feet).

The *Falcon*, situated 2 miles north-west from Vernon, near the *Blue Jay*, has a shaft 50 feet deep and an open cut 25 feet long. The ledge carries arsenical iron, a little galena and free gold. Free gold has been taken out of each 10 feet of shaft, and some pockets assayed as high as 500 oz. in gold on samples.

The *Bachelor No. 1* and *No. 2* are a couple of adjoining claims east of Okanagan Landing a short distance. On these claims there is 35 feet of shaft, 30 feet of open cuts, and a tunnel 57 feet long. The ledge is a fissure in granite, 5 feet wide, and carries values in gold and copper.

The *Silver Queen* mineral claim, owned by the Silver Star Mining Co., is situated about 12 miles north-east from Vernon, on Aberdeen Mountain, at an altitude of about 5,800 feet. The vein on this claim is from 4 to 7 feet thick, carrying values in gold, silver, and lead. It was bonded last October to an English mining company, of Manchester, and, I understand, sufficient work will be done on it next year to thoroughly test the extent and value of the ore body. There is now a shaft, 82 feet deep, on it, and some 25 feet of open cuts.

There are some 25 other claims staked in the vicinity, on none of which much work has been done.

The *Prince of Wales* mineral claim is situated on Aberdeen Mountain. The ledge on this claim shows for a distance of about 600 feet along the surface, and is about 4 feet wide. The work done on the claim consists of a tunnel, 75 feet, and 25 feet of open cut.

The *Black Prince* mineral claim is on the same ledge, and adjoins the *Prince of Wales*. Both are owned by H. McMullen, of Vernon. On the *Black Prince* there is a tunnel, 25 feet, and 40 feet of open cut.

The *Bon Diable* mineral claim, situated $3\frac{1}{2}$ miles north-east from Vernon, has considerable work done on it, consisting of a 47-foot shaft, a 100-foot tunnel, and 100 feet of open cut. Values in gold and silver. Has shipped one ton as a sample.

The *Okanagan* mineral claim, situated on the east shore of the lake, two miles north of Penticton, shows a strong vein, 3 feet wide, in granite. The chief value is in gold. The work on it consists of a 95-foot tunnel, a 100-foot shaft, and 12 feet of drifting on the ledge. There is some 200 tons of ore on the dump, but none has been shipped this year.

Owned by the Olds Bros., consists of the *Paladora*, *Meadow View*, *No. Paladora Group*, *2*, *Conwall*, and *Reward*, and is situated at the head of Fire Valley, about 25 miles from the Arrow Lakes and 60 miles east from Vernon, in the heart of the Gold Range, at an altitude of about 6,000 feet. These claims have attracted considerable attention during the past year, some of them having very clearly-defined ledges of quartz, carrying free gold, assays made giving values of \$25 per ton. Some \$2,000 has been expended on the group, mostly in surface work and shafts. The want of a road is the chief difficulty to be contended with. What is urgently wanted now is a road for about 15 miles from the end of the present Cherry Creek Road to the head of Fire Valley. This road should not cost more than \$300 per mile.

East of the *Paladora Group* about 5 miles, some 60 new claims were staked last fall, on veins containing tellurides carrying high values in gold. Alex. Stansfield, who owns several of these claims, has a gang of men at work on them, but there is scarcely enough work done on any of them to demonstrate the value of the ore bodies. The country rock is of a diorite and schist formation and very little broken, as proved by the distances the veins can be traced along the ridge.

Fourteen miles west of the *Paladora Group*, on Monashee Mountain, some 65 new claim were staked last October. Some of them contain narrow ledges or stringers very rich in free gold. The Duncan Mines Company, of Nelson, owns some very promising properties in the vicinity, and has a small gang of men now at work, under the superintendence of E. H. Hughes.

The Canadian-American Mining and Development Co., of Peachland, owns some 24 claims in the vicinity of Glen Robinson, 15 miles west of Peachland. The country rock in the vicinity is mostly granite and porphyry. The Company has expended considerable money in development work.

The *Alma Mater Group* lies a short distance north of Glen Robinson, at an altitude of about 4,000 feet, and includes the *Alma Mater*, *Golden Crown*, *Mountain Queen*, *Shiloh*, *Arthur B.*, *Golden Tarry*, and *Rosebud*. Three tunnels have been driven on these claims, respectively 218, 110 and 72 feet, and three shafts, 14, 13 and 10 feet deep, sunk. The ore taken from the ledge runs well in gold and silver.

The *Silver King Group* includes the *Silver King*, *Mary F.*, *Canadian King*, *Julia Anna*, and *Dr. L.* All the work done is on the *Silver King*, and consists of a shaft 250 feet, a tunnel 230 feet, and 190 feet of cross-cutting. The ore is mostly free-milling.

The *Kathleen Group* lies 9 miles west of Glen Robinson, on Bald Mountain.

The same Company which owns the *Alma Mater*, *Silver King* and *Kathleen Groups* also owns the *Mineral Hill Group*, 9 miles north of Glen Robinson. The ores are all base in character. No development work worth mention has been done on the claims, owing chiefly to the want of better transportation facilities.

The Camp Hewitt Mining and Development Co., of Vernon, has expended some \$9,000 in developing its properties at Camp Hewitt during the past year. It owns the *Stag*, *Dandy*, *Winifred* and *Gladstone*, all of which lie on the lake shore, within two miles of the town of Peachland. The particulars of the work are as follows:—A tunnel on the *Dandy* 111 feet; shaft on *Stag* 40 feet; shaft on *Winifred* 26 feet. Assays made of the rock taken from the shafts on the *Stag* and *Winifred* show the ore to contain gold, silver and copper, in value from \$10 up. On the *Gladstone* there is 130 feet of tunnelling and a shaft 158 feet deep, with cross-cuts at the 100 and 150-foot levels.

The following statistics, furnished by Mr. J. C. Tunstall, Mining Recorder, show the mining transactions for the year:—

OFFICE STATISTICS—VERNON DIVISION.

Free miners' certificates	289
" " (companies)	5
Number of claims recorded	192
Certificates of work issued	89
Certificates of improvements issued	6
Claims Crown-granted	6
Hydraulic leases granted	1

BOUNDARY CREEK DISTRICT.

Boundary Creek District, or the "Boundary Country," as it is frequently called, is a designation not having official authorization, but popularly used to denote that section of country lying immediately north of the 49th parallel and to the westward of the Trail Mining Division, the western limit being rather indefinite. The designation covers, however, practically all of the Grand Forks, Kettle River, and Osoyoos Mining Divisions, and in such sense is here used.

The District has for some years past been receiving a great deal of attention from prospectors, and later from capitalists, a large number of properties having been located and many of them considerably developed. In the two first-mentioned Mining Divisions, a number of very large ore bodies have for years been known to exist, and on many of these enough development has been done to prove their great size and permanence. The question of the quantity of ore present in the District has, therefore, been for some time regarded as satisfactorily settled.

As regards the quality or value per ton of the ore, it has also long been recognised as a fact that, speaking generally, the ores are "low grade," so low, indeed, as to preclude any possibility of their being worked to a profit, except with the advantage of good railway facilities, which have hitherto been lacking. Consequently, work has been confined to development, and no ore has been mined except as incidental to such development. Development even reached its practical limit when heavy machinery became necessary, as the cost of transportation was great, and no immediate return for the outlay was possible.

The value per ton of the ore is a question which can only be ascertained approximately, as the mineral in a given ore body is found to be so unevenly distributed as to render satisfactory sampling extremely difficult. Speaking generally, and of the more usual ores of the District, viz., iron sulphides carrying copper and gold values, it is estimated that these, as they will be mined, will not average more than from \$10 to \$12 per ton, smelter values.

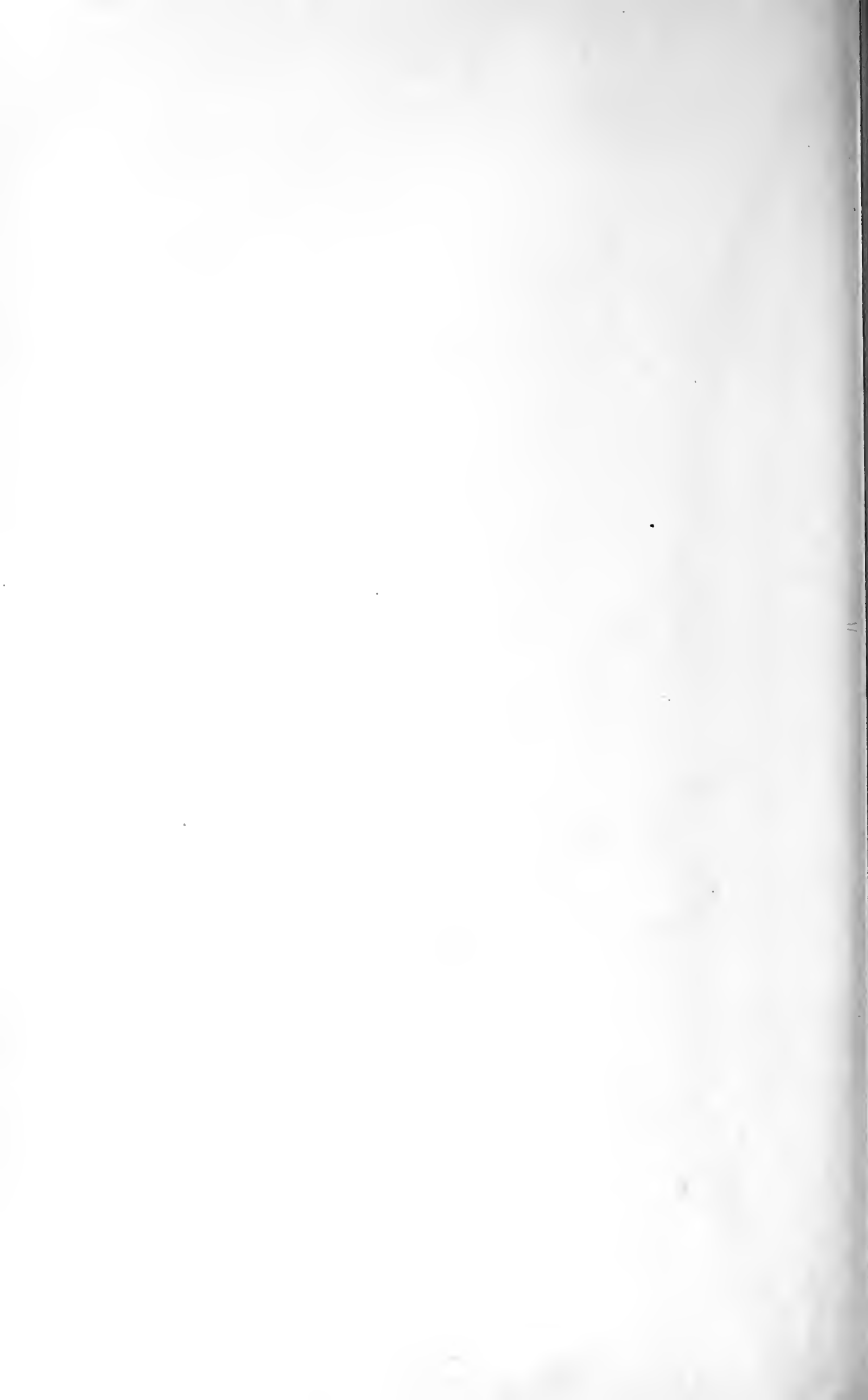
In ore bodies such as exist in this District, accurate sampling is practically an impossibility. In a given body, for example, the ore will range from a barren pyrrhotite up to another, of very similar appearance, carrying high gold values, while the copper contents in different parts of the same ore body will vary proportionately as much.

The grade of the ore will only be satisfactorily determined when actual mining has been carried on for some time, and has been regulated by the smelter returns on shipments, although too much reliance must not be placed on these returns for the first few months. The whole question should be settled during the present year (1900), since, last fall, most of the larger prospects were given railway connection, with sidings to their dumps, while, in addition to the already established public smelter at Trail, smelters have been erected at both Grand Forks and Greenwood.

The Columbia and Western Railway, a branch of the C. P. R., was last summer built from Trail to Midway. Starting from Trail the railway skirts the Columbia River for some distance, passing through West Robson; at a point some 18 miles beyond this town it leaves the river and runs westward, crossing the mountain range, at the summit of which a tunnel of about three-quarters of a mile was found necessary.



CANADIAN SMELTING CO.'S WORKS AT TRAIL, B. C.



On the west side of the mountains the road turns southward, following the east shore of Christina Lake, crossing the Kettle River at Cascade, and again at Grand Forks. From Grand Forks the line continues up the North Fork of the Kettle River as far as Brown's Creek, which it follows up to the dividing summit and, crossing to the headwaters of Boundary Creek, follows that creek southward, past Greenwood, to Midway.

This is as far as the railway has been actually completed, but it is expected that the coming summer will see it extended westward, and eventually connected with the main line of the Canadian Pacific Railway somewhere on the Fraser River.

From this main branch line spurs have been run into all of the more important mining camps, wherever the development gave the slightest justification for so doing and the construction of a railway was practicable.

The railway is first-class in every particular—as well built as the main line; no money has been spared to provide the best accommodation possible, and the Company has shown great faith in the District, in some instances even building spurs to properties where, it must be acknowledged, present development seems scarcely to warrant the expense.

The properties so far developed are “smelting propositions,” although in some instances concentration will be resorted to and, I think, it will be found that such concentration will have to be adopted in many cases where it is not now in contemplation.

As I have before stated, the chief feature of the camp is large bodies of very low grade ore, and the future of the District lies not so much in the hands of the miner as it does in those of the metallurgist; although cheap mining is an essential, the great problem to be solved is the subsequent treatment of the ores.

SMELTING WORKS.

The Canadian Smelting Co.'s Trail smelter must be considered as **Trail Smelter.** having the “Boundary Country” tributary to it. Using the Rossland camp as a base of ore supply, with the Boundary ores as a desirable flux or admixture, it would seem as though this smelter ought to be a strong competitive purchaser of Boundary ores, despite the lengthy railway haulage, which, however, is somewhat offset by the shorter haulage for coke and supplies.

This smelter is, in fact, the old “Heinze smelter,” and, although it can scarcely be called up to date, has been remodelled so far as it is possible to remodel an old smelting plant without tearing it completely down.

Sulphide copper ores are roasted in stalls or on open piles, and smelted in water jacket furnaces; a new modern furnace was in course of construction in October last. The resultant matte, which is exceedingly low grade, is roasted in “Bruckner cylinders,” of which there is a small battery, and is again smelted.

The higher grade matte was not treated at the works, but was shipped to an electrolytic refinery in the United States.

This smelter has also undertaken the treatment of lead ores, and although no ore had been actually smelted, several thousand tons were ready “bedded,” and the furnaces, &c., were in readiness at the time of my visit for a first campaign.

The plant is equipped with all necessary appliances and machinery, and is under the experienced management of Mr. W. H. Aldridge, as General Manager, and Mr. A. J. Dean, as Superintendent.

This plant is being built by the Granby Smelting Co., of Granby, Que.

Grand Forks Smelter. The directorate of this Company is so intimately associated with that of the *Old Ironsides*, *Knob Hill* and *City of Paris* mines, that this smelter may be considered as an adjunct to these properties, although nominally under a separate control. The ores from these mines will undoubtedly form the basis of supply, but it is understood that custom ores will also be smelted.

In October last, the time of my visit, practically only the grading for the works and a few flue walls were completed, so that it is of these only I can speak with any certainty. I was, however, shown blue prints of the plans, which were prepared by the Gates Iron Works, of Chicago. The construction was under the charge of Mr. Hodges.

The site chosen for the smelter is on a knoll, on the opposite side of the North Fork of Kettle River from and about half a mile above the town of Grand Forks. The easy slope of the hillside is somewhat utilised in the arrangement of the smelter plans, and provides a fair slag dump.

The ore will be brought in by cars, running on high timber trestles and dumped thence into elevated bins, which, in turn, will discharge into buggies running on the upper ground or "charging floor" level. These buggies will discharge the ore into a crusher set into a pit in the ground, and an elevator will be provided to raise this ore again into buggies or bins, for transference to the roast piles or to the furnace, as desired. The blast furnaces will stand on a level some 10 or 12 feet lower, and will be provided with long brick dust chambers intervening between the furnace and the chimney. Sampling and crushing works were also being constructed. Extensive arrangements were being made, at a point about one-half or three-quarters of a mile further up the river, to utilise the water-power of the North Fork and, at the same time, to convey water to the smelter. A dam was in process of construction, and some little trouble was being experienced in getting a proper foundation for it, but, I have since heard, this difficulty has been successfully overcome, and the structure is now nearing completion. The plant was expected to be ready to "blow in" early in the spring of 1900, by which time the railway communications with the mines ought to be in working order.

Greenwood Smelter. The B. C. Copper Co., which owns the *Mother Lode* and other mineral claims in Deadwood Camp, had, last October, just begun the building of a smelter on the west side of Boundary Creek, about half a mile below the town of Greenwood. The construction had, at that time, only progressed as far as the erection of a temporary office for the Superintendent and a carpenter shop, together with a little preliminary clearing and grading. The work was in charge of Mr. Paul Johnson, whose plans were not then sufficiently matured for me to be able to describe what the plant will eventually be, save that it is to be so designed as to treat 250 tons of ore per day, and is to be extended later as required. The site chosen for the smelter is one having great possibilities, and upon which a very convenient plant could be built, a fact to which Mr. Johnson was quite alive. This plant, also, was expected to be ready for operation in the spring of 1900, by which time the railway connection should be completed.

GRAND FORKS MINING DIVISION.

City of Paris Group. This group comprises the *City of Paris*, *City of Lincoln* and *No. 4*, all Crown-granted claims, owned by the City of Paris Gold Mining Co., of Montreal; Manager, J. P. Graves, Spokane; Superintendent, W. Yolens Williams, Rossland.

These claims, which adjoin, are situated in Central Camp, Grand Forks Mining Division, near the dividing line between that Division and Kettle River Mining Division, some three-quarters of a mile north of the 49th parallel and at an elevation of almost 4,175 feet above sea level.

The three claims are worked as one property, the main cross-cut tunnel starting on *No. 4* and following pretty closely the dividing line between the *City of Paris* and *City of Lincoln* claims.

The main lead, which is fairly well-defined on the surface, is about 35 feet wide, of quartz carrying iron and copper pyrites and dips N. E. into the hill at an angle of about 45°, having a strike about N. 22° W. and apparently running the length of the two last-mentioned claims.

There appear to be other smaller leads, parallel to the main lead and of the same general character, as exposed by the cross-cut tunnel.

The development consists of a main cross-cut tunnel, about 850 feet long, running N. E. and cutting the main lead at about 230 feet vertically below the out-crop. From this main tunnel drifts have been run, one to the N. W. on the main lead, for a distance of about 600 feet, connecting with the shaft sunk from the out-crop on the *City of Paris*, and a second drift to the S. E., for about 300 feet, on a parallel lead, passing under a shaft which was started downwards from the out-crop of this lead on the *City of Lincoln*. The total development work, including shafts, tunnel and drifts, amounted on October 1st, 1899, to about 2,700 feet.

The management has planned to run in a tunnel starting from a point some 427 feet lower than the present tunnel, to cut the main lead at 660 feet below the out-crop. It is calculated the length of this tunnel will be about 2,000 feet.

Values. The values obtained are low, the average across the main ledge being placed at approximately \$5 per ton, about equally divided between gold and copper. Along the hanging wall in the main N. W. drift there is, however, a more or less clearly defined pay-streak, varying in width from 1 to 24 inches, from which, owing to its greater mineralization, much higher values are obtained, running, it is said, from \$25 to \$100 per ton.

The shaft on the *City of Lincoln* claim showed a higher percentage of copper than was elsewhere obtained, and I am informed by the management that the eastern end of the property does, as a rule, yield higher copper values than the more westerly portions.

The property, by itself, would necessarily be a concentrating proposition—by which I mean concentration by water; water is, however, very scarce both at and near the mine, so that, if such treatment was adopted, the ore would have to be transported, probably to Fourth of July Creek. The chief shareholders in the Company are, however, interested in the Grand Forks smelter, now in course of erection, and as the ore from the *City of Paris Group* would serve admirably as a flux for that from the *Old Ironsides* and *Knob Hill* mines, which will send their output to this smelter, it is probable that it will be so used.

Plant. The plant consists of a 10-drill Rand air compressor with the necessary boilers, etc., all of which are suitably housed and are located in the valley near the site of the mouth of the proposed 2,000 foot tunnel.

At present the compressed air is being conducted up the hill in pipes to the present workings, and at the time of my visit was being supplied to two Rand drills.

On the property are suitable offices and quarters for the foremen and employees, together with a good cook-house, store, stable, blacksmith's shop, etc.

Some 20 men were at work underground, while on the surface about 34 men were employed between this company and the Majestic Gold Mining Co., which is under the same management.

This group consists of the *Lexington*, *City of Denver*, *Oregon Fraction*, *Lexington Group*. and *City of Montreal* mineral claims, the first three of which are Crown-granted. It is owned by the Majestic Gold Mining Co., and is under the same management as the *City of Paris* Gold Mining Co. These properties lie directly to the west of the *City of Paris* claim, but it is questionable whether they are on the same lead. The country rock hereabouts has been somewhat disturbed, and is so covered by soil and the timber that it is difficult to trace leads on the surface.

The development work consists of a 250-foot tunnel, and a cross-cut of some 20 feet in length running on the hanging wall of the lead. The pay ore appears, at present, to be from 3 to 5 inches wide. The values obtained are stated to be about 5 per cent. in copper and \$5 in gold per ton, together with a little silver. The general character of the ore is somewhat similar to that of the *City of Lincoln*. The property is not yet far enough developed to show its ultimate value, but it gives promise of good results.

A very fair waggon road was built last summer, connecting the two last-mentioned properties with the main road from Grand Forks to Greenwood. The grades are easy, and are all, with but one exception, downhill to Grand Forks, thus enabling ore to be hauled to the smelter, by waggon or sleigh, at a reasonable cost.

SEATTLE CAMP.

The *Seattle* mineral claim is situated on the west slope of the North Fork of Kettle River, some 13 miles from Grand Forks, and is owned by the Seattle Mining Co., of which the agents are Messrs. Hay & McCallum, Columbia. The property, which is at an altitude of about 2,100 feet, lies above the waggon road some distance, but below the track of the Columbia and Western Railway.

An open cut in the hillside shows a dyke of hard, greenish, volcanic rock in contact with an area of white, crystalline limestone. This dyke is sparsely mineralized with iron sulphides, carrying gold values and a small percentage of copper pyrites throughout. There does not appear to be any definite boundary to the mineralization of the dyke, which appears to extend, in places, to a width of about 50 feet. The work done on the property is not sufficient to prove its value, but such exposures as I could find did not possess any very important mineralization.

The *Seattle Fraction* mineral claim lies north of the *Seattle*, and is said to be part of the *Royal Canadian Group*. There was no one on the property at the time of my visit, and I was unable to find the other claims of the group.

On the *Seattle Fraction* there is a pit, some 10 feet deep, in limestone which carries a small percentage of copper pyrites. Some 100 feet lower down the hillside, a tunnel had been run for about 55 feet, with the evident intention of cutting, at that depth, the showing of mineral exposed in the upper pit. It had not, however, progressed far enough to reach the point where this showing might be expected.

There are numerous other surface cuts and strippings, which have not as yet shown up mineral of serious importance. The value of the property cannot be judged from the present workings, and will depend entirely on the success attained in the tunnel already mentioned. While the mineralization appears to be in lime, it occurs at or near the contact of the limestone with a volcanic rock, probably diorite.

Tip-top Fraction Mineral Claim. This claim lies above the Columbia and Western Railway track a short distance, at an elevation of about 2,800 feet. It is owned by Chas. Mathieson and H. A. Ross. On a gently sloping hillside there is exposed a porphyritic dyke, more or less mineralized with copper and iron sulphides, and said to carry certain gold values. The mineralization is not very heavy, and, unless the gold values prove higher than is usual in this camp, cannot be considered important. I took no samples for assay, as I did not consider development had progressed far enough. The development work on this claim is peculiar, and consists of a tunnel run into the hillside and opening into a cave-like excavation, from which a hole or chimney has been cut to the surface. The tunnel, after proceeding some 20 feet, continues downward at an angle of about 45° for another 20 feet, when it dips nearly vertically for 10 feet, and finally runs on at a level for about 20 feet further. The claim was not being worked.

The *McKenzie Fraction* mineral claim is a location situated just above the Columbia and Western Railway track, about 12 miles from Grand Forks, up the North Fork of Kettle River, and is owned by H. A. Ross.

Development on this claim had only just begun, at the time of my visit. Two men were at work, and had made a 10-foot open cut, and, on October 8th last, were starting a tunnel, in order to cut a dyke carrying a percentage of copper pyrites.

The *Bismark* mineral claim lies some distance to the south-west of the last-mentioned property, higher up the hill, and is also owned by H. A. Ross. I was unable to visit it, as darkness was coming on, but I learned from the owner that, at the western end of the claim, he has developed a 7-foot quartz ledge, carrying copper pyrites, on which he has run a 30-foot tunnel. At the eastern end of the claim occurs a dyke, containing iron and copper sulphides, carrying silver with a little gold, and on this showing he has sunk a 12-foot shaft and made a 30-foot open cut.

Mr. Ross has, in this vicinity, other claims on which slight development has been done, viz.: the *No. 1*, *Standard No. 2*, *Blue Bird*, and *Nevada*.

This claim is situated on the main waggon road, which runs up the **Humming Bird** west side of the valley of the North Fork of Kettle River, and is about a quarter of a mile above Neil Hardy's hotel at Lime Creek. The property is owned by the Humming Bird Gold Mines, Ltd., of which J. L. G. Abbott, of Rossland, is secretary and Smith Curtis is superintendent and general manager.

In the limestone bluff which at this point rises precipitously from the waggon road, and at an elevation of about 50 feet above such road and valley bottom, there shows on the surface a body of iron sulphides, chiefly pyrrhotite, carrying gold values, with a small percentage of copper pyrites. This ore body is about 4 feet wide at the surface, of solid ore, dipping into the hill at a flat angle, and not being well defined. On this showing an irregular tunnel or incline had been run in for some 15 feet, disclosing for that distance a fair body of ore. This work was here stopped and a working tunnel started, some few feet lower and slightly to the north of the other. This tunnel was run westward into the hill, nearly at a level, for some 90 feet. At about 20 feet in the tunnel struck the ore body, which was here about 2 feet thick, cutting across the tunnel and dipping to the north-west. The tunnel then continued for the remaining

60 or 70 feet without encountering pay ore. At a point 20 feet within the tunnel a drift had been started to the right (or north), following the ore, which practically cut out in a few feet. After running north-west for some 15 feet, this drift turns to the right, going in a direction about parallel to the main tunnel, but 12 feet or so to the north, and following an apparent foot-wall, with a little mineral, which dips to the west on an average angle of from 10° to 15° . The drift was, at the time of my visit, about 50 feet in from the turn, and within the last few feet the foot-wall mentioned appeared to drop off abruptly, and to be making ore in the face. I returned to the property within two days and found that, on the north side of the drift, the face showed solid ore for at least four or five feet, with ore still in the bottom. I have not since heard how far this ore continued. The ore is a compact pyrrhotite, with copper, probably 2 to 3 %, and with gold values said to be about \$12 to the ton.

The ore and rock from the inclined drift has to be shovelled up in two or three lifts, and it is finally taken out in a wheelbarrow and dumped into a bin on the hillside, on the upper side of the road, the waste being wheeled above the road on an open trestle and dumped on the lower side. There were no buildings on or belonging to the property, the six or eight men employed living in tents.

This claim is situated on a low range of hills lying to the north of Strawberry Brown's Creek, which flows from the west into North Fork. It is up the Mineral Claim. southern slope of the valley of Brown's Creek that the Columbia and Western Railway (C. P. Ry.) reaches the summit separating the North Fork of Kettle River from the head-waters of Boundary Creek, but the railway is here at such an elevation above the river valley as not to be of much direct service to this claim, although it seemingly passes so close.

The claim is owned by the Quebec and Boundary Gold Mining Co., of which Mr. A. B. Clabon, of Rossland, is manager.

The country rock is chiefly diorite and porphyry, seemingly injected and overflowing, covering and mixed up with very highly altered sedimentary rock, with occasional bodies of limestone showing at intervals. I was, however, unable to discover any regularity in the formations, although these rocks seemed to have a trend of about N. 20° E., and to be cut at right angles by later diorite dykes.

There had been little more than prospecting done on the property in the beginning of October. An 8-foot pit had been sunk at the Discovery point, and, about 100 feet from this, was another pit 10 feet deep, while some few hundred feet to the north-east there was a shaft 50 feet deep, all of which had been sunk on a generally mineralized zone, and in each was some showing of iron sulphides, with very little copper, which was said, however, to carry gold values to the extent of \$4 or \$5 per ton.

At the shaft, an open cut had been run into the bluff, just behind the shaft house, and here a few tons of ore had been taken out, carrying a fair percentage of copper. This ore appeared to me to have been taken from a small cross-vein or offshoot rather than from the main mineralized zone, and, although values of \$18 per ton had been obtained, I did not consider that it was in a sufficiently large body to be important. As a matter of fact, no important body of ore had been discovered, but the indications, particularly in the 10-foot pit, gave strong reason to expect that a body of pyrrhotite might be struck, the values of which would, I expect, be confined to gold, and would not exceed \$10 per ton, together with a little copper. The property is a prospect only, with very considerable possibilities of being a good-sized, very low grade proposition.

The following letter received by me from Mr. Clabon, and dated February 15th, 1900, gives later information:—

“I am pleased to be able to tell you that, after sinking a shaft on the *Strawberry* mine, “at the point suggested by you, to a depth of 60 feet, and cross-cutting for a distance of 26 “feet, we encountered a very large ore body. At the present time, the cross-cut is extended “for some 25 feet through ore from which some very fair values are obtained, as high as \$13.44, “and no walls in sight.”

Some 6 or 8 men were employed at the time of my visit, under seemingly good supervision. The mine buildings were temporary but sufficient. A wooden cook-house, bunk-house, and foreman's office had been constructed in the river valley, about one-third of a mile from the mine.

The *Lilly K.* mineral claim is situated about one mile to the north-west of the *Strawberry*, on the same range of hills but at a higher elevation, being about 3,400 feet above sea level. The claim is reached by a trail from the North Fork of Kettle River Waggon Road, over very easy country. There is a shaft about 50 feet deep, but which I could not go down, and which was partially filled with water. The claim was not being worked.

Judging from what lay on the dump, and from what could be seen from surface workings, the ore consists of the usual iron sulphides, presumably carrying small gold values, and with a little copper pyrites scattered throughout. It did not appear that any solid ore had been encountered, and the mineralization was not very strong. The country rock is of igneous origin, much broken.

The *Twins* mineral claim lies to the north-west of the *Lilly K.*, adjoining it, or nearly so, and some 200 feet higher. There are two heavy “iron caps” exposed on the surface, more or less parallel and some 50 feet apart. On the first of these a shaft has been sunk some 50 feet, and on the second a shaft of 65 feet, with a drift from the bottom. Both shafts were partially filled with water and could not be descended. The property was not being worked, and appeared to have been abandoned for some time. The ore is practically the same as on the *Lilly K.*, though there appears to be a greater amount of solid pyrrhotite, and indications of a larger ore body. The owners are Porter Bros., Greenwood.

The *Iron King* mineral claim is a north-west extension of the *Twins*, and is of the same general character. Little work has been done on it.

This group consists of the *Earthquake*, *Phil Sheridan* and *New Last Earthquake Group*. *Chance* Mineral Claims, and is situated on the east side of the Kettle River, a little north of Volcano Creek, in what is known as Brown's Camp. The property is owned by the *Earthquake Consolidated Gold Mining Co., Ltd.*; Chas. A. Parnell, President; Frank Sears, Secretary. D. G. Evans is foreman at the mine.

The property lies on a gently sloping hill, which appears to be chiefly composed of diorite much cut up by porphyry dykes. The general trend of the country is about north and south.

No. 1 Tunnel on the *Earthquake* claim follows up a very regular quartz vein, which varies from 6 to 20 inches in width, having a strike N. 70° W. and dipping vertically. The tunnel follows this vein for 150 feet, at which point a cross-cut has been set off to the right (south-west) and run for 80 feet, but although one small vein was met with, no mineral of importance has been struck in this cross-cut.

Mixed through the quartz vein-matter there is a certain amount of iron sulphides, with a very little copper, the values being in gold and running from \$5 to \$15 per ton, though picked samples are said to have given as high as \$40 per ton.

What is known as the Powder Tunnel had been run in some 40 feet on a very regular and promising quartz vein, carrying considerable mineral; towards the "face," however, the vein played out.

On the *Phil Sheridan* claim considerable surface prospecting had been done and several small irregular veins, showing mineral, had been found.

Near the top of a small hill a very fair vein had been uncovered and a pit sunk on it for some 10 feet, showing from 18 to 28 inches of quartz, frozen to the diorite walls and carrying iron sulphides, from which fair gold values, running between \$20 to \$40 per ton, had been obtained. This is supposed, by the management, to be a continuation of the *Golden Eagle* vein, but the conjecture is open to doubt.

Some little distance lower a tunnel had been driven in for 75 feet, to the west, with a cross-cut of 50 feet to the north and another of 15 feet to the south, with the intention of developing the surface showing just referred to, but work had not progressed far enough to show what the result would be.

At the time of my visit some 8 men were being employed under competent management. Excellent accommodations were provided for the men and their cabin, a cut of which accompanies this Report, though not costing much money, was one of the best in the District.

This group consists of the *Golden Eagle*, *Laskay* and *Junction City* Mineral Claims, held by the Royal Victoria Mining Company of Greenwood; capital, \$1,000,000; — Whiteside, Secretary. J. H. Fox, the Superintendent at the mine, was employing some 4 men.

The claims are situated adjacent to and to the north-west of the *Earthquake*, at an elevation of about 3,275 feet above sea level.

The country rock seems to be a diorite and porphyry, at the contact of which an irregular shaft has been sunk some 100 feet. At the 70-foot level a drift has been run on the east and west contact for a distance of 40 feet. At the end of this drift a winze was down a depth of some 35 feet, from the bottom of which another drift had been started and was in a few feet.

From the drift at the 70-foot level a small incline had been driven for a few feet, following a stringer of ore.

The formation is much twisted and confused, as are also the workings, which amount to about 200 feet in the aggregate.

The ore, which consists of iron and copper pyrites with silver and gold, is said to run about \$25 to the ton. The gangue is more or less calcareous.

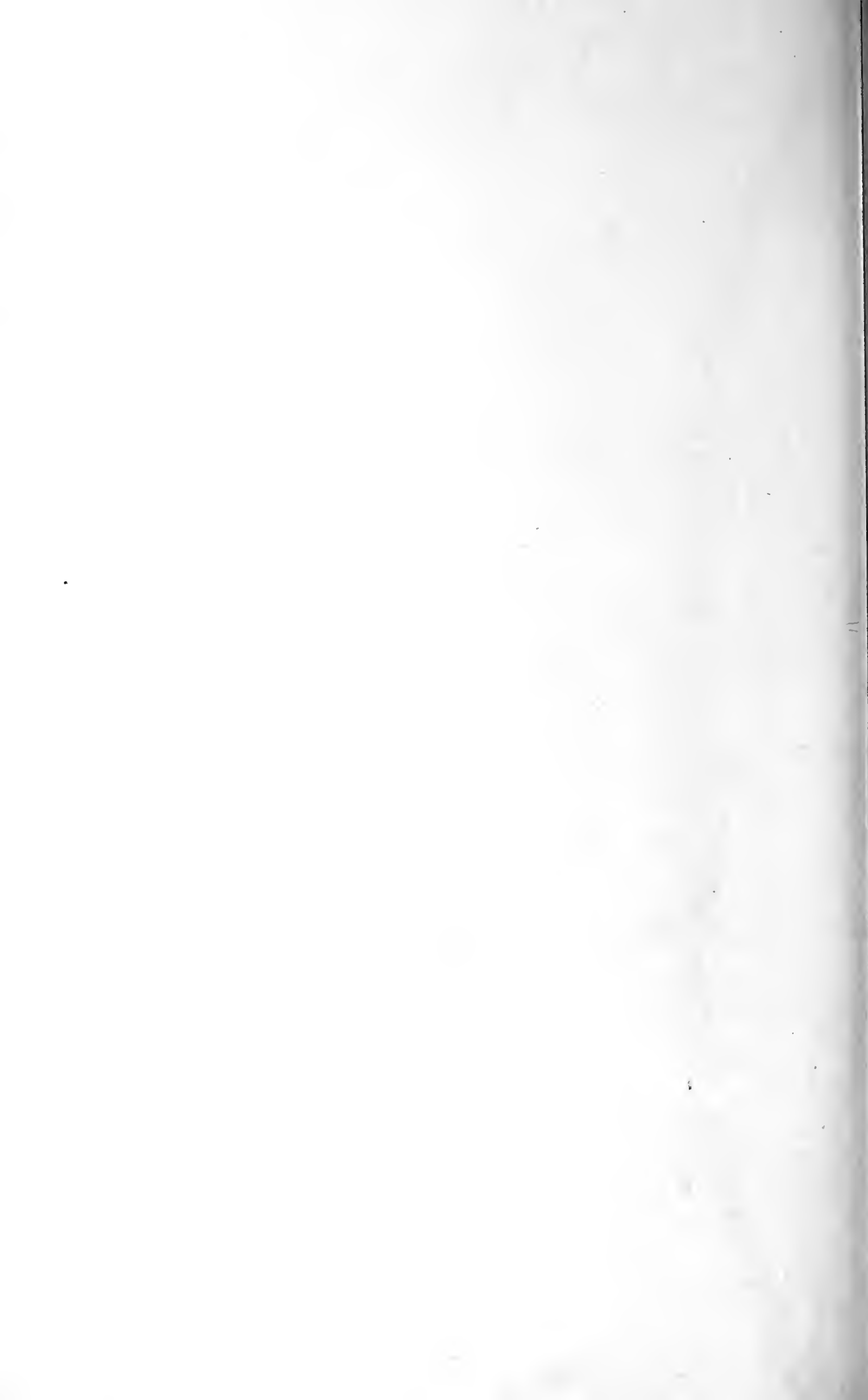
There is a very fair showing of ore near the winze and also around the shaft, but no defined ore body has as yet been shown up.

It is by these names the claims are best known, although they have been re-located as the *Volcano* and *Fententine* Mineral Claims. These properties, which are owned by Mr. R. A. Brown, of Grand Forks, and situated on the east slope of the North Fork of Kettle River, just north of Volcano Creek and opposite, across the valley, to the mouth of Brown's Creek, up which the Columbia and Western (C. P. Ry.) Railway runs.

This is one of the most interesting propositions in the District, partly from the nature of the deposit and its immense surface showing, forming a feature of the landscape, and partly from the profound faith exhibited by the owner, Mr. R. A. Brown, in the future of the property. Mr. Brown has driven, with his own money, a tunnel 515 feet long, in an endeavour — so far unsuccessful — to strike at a depth an ore body, supposed to lie under an immense



THE TOWN OF GRAND FORKS, 1899.



“iron cap,” which covers a high steep promontory on the east side of the North Fork of Kettle River. The surface oxidization of this iron gives the hill a red colour, which is noticeable for miles.

A closer examination of the hill and iron cap shows an immense igneous dyke, nearly 1,000 feet wide in places, cutting through lime and prophyry in an east and west direction, and exposed on one side of a hill which rises nearly 1,000 feet above the valley.

Surface weathering of the dyke and oxidization of the iron have covered the outcrop with an ochraceous looking material, which gives the red colour to the hill.

The dyke matter is heavily impregnated with iron sulphides, probably pyrrhotite, carrying small gold values.

This impregnation of the dyke is comparatively uniform, or, at least, there do not appear to be any especially rich streaks as far as it has been prospected.

It is strange that such a remarkable surface showing of mineralization should not have received some serious investigation, since the values found, some \$2 or \$3 in gold with a little copper, while not in themselves important, give sufficient encouragement to justify serious prospecting; yet only a little surface stripping has been done. This, it is true, showed up simply the mineralized dyke matter, which may have discouraged further investigation.

Whether the dyke is accompanied by an ore body is not known, and the driving of the before-mentioned tunnel at the base of the hill can not be accepted as a serious attempt to find out.

This tunnel, started over 1,000 feet vertically below the “iron capping,” was in about 515 feet at the time of my visit, but had not disclosed any mineral of value, nor had it cut the mineralized dyke. The work in the tunnel has been well done, but it seems a pity that so much labour should be expended here and none near the surface exposures.

This group consists of the *Pathfinder* and *Pathfinder Fraction* mineral claims, owned by the Pathfinder Mining Co., of which Thos. J. Parkinson is President; Chas. A. Parnell, Treasurer, and D. M. Watters, Secretary, all of Grand Forks. H. R. Parsons is Superintendent.

The property is situated on Pathfinder Mountain, about two miles north-east of the *Volcano*, and some fourteen miles from Grand Forks, at an elevation of about 3,500 feet.

Considerable development work has been done on the property, amounting, in October last, to about 220 feet of shafts and 530 feet of levels, &c.

Three main ore bodies, of a somewhat irregular character, have been partially developed by the above workings. These ore bodies are large, low grade masses of pyrrhotite, carrying gold and a little silver, with occasionally a little copper, and said to run about \$15 to the ton.

The formation is prophyry and a diabasic rock, the ore occurring, seemingly at or near a contact, in a quartzose gangue.

The exact dimensions of none of the ore bodies have been determined, but enough work has been done to amply justify the putting in of machinery to thoroughly prospect the property.

To this end preparations were being made to sink a two-compartment shaft, and to install hoist, pumps and a 5-drill Rand compressor.

There were 500 or 600 tons of very fair looking ore on the dump, and the general indications were favourable to the finding of considerable bodies of ore equally good.

The property was being worked in a conservative manner, and the fact that it was still in the prospect stage recognized.

Good offices, manager's house, bunk and cook houses, stables, &c., had been erected, and everything appeared suitable and well cared for. In October some seven men were at work underground and four above, and I was told that some thirty men had been employed during the summer.

Pay Ore. The *Pay Ore* mineral claim is situated to the west of and adjoining the *Pathfinder*, at an elevation of 3,400 feet. Owner, the Pay Ore Mines, Ltd., of Rosslund; Smith Curtis, agent. Upon the steep hillside and dipping into it there appeared to be a crushed zone, into which had infiltrated quartz carrying iron and copper pyrites with gold values. Some 15 or 20 feet below this showing a tunnel had been run in N. 40° E., to cut the ore body, and at the time of my visit had advanced about 150 feet, much more than would appear necessary to reach the ore had it continued as indicated on the surface. I could not see any proof of the existence of an important body of ore, either in the cut or in the tunnel. Five men were at work on the property.

Richmond and *Alpine Fraction* mineral claims; owners, Frank Richmond, Alpine. McGuire and Wm. Hamilton. These claims are situated about half-way up the *Pathfinder* waggon road, just where it crosses the creek. Tunnels have been run in from the creek bottom, on either side, for distances of 80 feet each, exposing a rather irregular quartz vein from 12 to 18 inches wide, carrying a quantity of iron pyrites which are said to assay from \$6 to \$26 per ton. The quantity of mineral exposed, so far, is not very encouraging, which is to be regretted, as the two working miners who own the claims are putting in only their own time and money on the venture, and are making an honest endeavour to show just what the property is worth.

Little Bertha. The *Little Bertha* mineral claim, of which the owner is A. T. Kendrick, of Grand Forks, lies about three-quarters of a mile north-west of the *Pathfinder* and *Pay Ore*, on the eastern slope of the North Fork of Kettle River, at an elevation of 2,800 feet. The main workings consist of an open cut, from which a shaft has been sunk on a quartz vein running north and south and dipping 80° to east. As this vein is exposed in the shaft it splits into two, each branch being from 12 to 20 inches wide. At a distance of some 15 feet down the shaft had been floored across, and from this level a drift had been run in for 10 feet. The shaft continues down some distance further, but I could not inspect it, for the reason mentioned. The quartz carries iron pyrites, with some copper pyrites, and is said to carry small gold values, but nowhere could I find any mineralization that might be considered important. Further down the hill there are two tunnels of 30 feet each.

Christina. The *Christina* mineral claim is owned by a company of which Al. Higgelberg is president and Smith Curtis secretary. This property is on the east shore of the North Fork of Kettle River, just below "Bannock City," which is merely a collection of a few cabins just off the *Pathfinder* waggon road, but boasting of an hotel and bar. A tunnel has been started, some 5 feet above the level of the water in October, but probably below spring water level, on a flat quartz vein, very much crushed, which dips into the hill at an angle of 30° to east, and has a strike north and south, or parallel with the river. This vein is irregular, from 2 to 4 feet wide, and, as stated, very much crushed, as also is the country rock. The quartz is sparsely mineralized with iron pyrites, said to carry gold values.

Other properties in this camp upon which some work has been done, but which I did not visit, are the *Arlington*, *War Cloud*, *Derby*, *Toronto*, *3.1*, &c., &c., all said to carry gold values in iron pyrites, with occasionally a little copper, the latter not amounting to much.

SUMMIT CAMP.

Rathmullen Group. This group consists of some fourteen full claims and two fractional claims, including the *Rathmullen*, *Maple Leaf*, *Ben Hur*, *Iona*, and others, and is owned by the Rathmullen Mining Co. The group is situated in Summit Camp, at an elevation of about 4,000 feet.

At the time of my visit, October 11th, 1899, the ground was covered with snow, so that little could be seen of the surface showings.

On the *Maple Leaf*, a vertical shaft, 4 feet 6 inches by 8 feet 6 inches, well timbered with 8 by 10 timbers, had been sunk about 130 feet, and was being continued to the 200-foot level, from which it was intended to drift to the ledge. The shaft was in a diorite country rock, the ore body apparently occurring in the diorite near a north and south contact with a porphyritic rock which formed the foot-wall, and which dipped at an angle of 80° towards the shaft. At the 70-foot level, a drift had been run for about 71 feet, and, at 40 feet in, this drift cut an ore body, through which it passed for 28 feet, and was then continued for 3 feet into the foot-wall of porphyry.

This ore body consists of a quartz gangue, largely mixed with the diorite country rock, and carrying iron sulphides (pyrrhotite) and a small percentage of copper, together with gold values which are said to range from \$12 to \$30 per ton on sorted ore. Solid pyrrhotite from the surface showings is said to carry \$8 in gold per ton. Should the ore body continue to dip at the present angle, it should be cut by the shaft at a depth of 300 feet.

The plant consisted of a small, single-drum, friction hoist, with vertical boiler, a pump, and a 3-drill Rand compressor; only one drill, however, was being used at the time of my visit. Comfortable quarters had been provided for the men (of whom some 6 were employed underground and 10 above), and the whole outfit constituted a very neat little prospecting plant.

The property is near the railway at Eholt, and, as soon as it is required, a "spur" will undoubtedly be run in. At present, this group, as is almost every property in the District, is provided with a fairly good waggon road.

B. C. Mine. This group consists of some twelve full and fractional claims, including the *B. C.*, *Novelty Fraction*, *B. C. Fraction*, *Daisy Fraction*, *London Fraction*, *Vashiti Fraction*, *J. W.*, *Hilda*, *Falcon*, *Truckee*, and *Reveille*, and is owned by the B. C. Chartered Company, Limited, of Montreal. The superintendent is J. M. Scrafford.

This property is unique in the District, inasmuch as the ore is a solid copper pyrites, carrying little iron sulphides, and having practically no values in gold or silver; the silver value is said to be only about $\frac{1}{2}$ oz. to the unit of copper. On the dump were piles of first and second-class ore, amounting to several thousand tons, and ready for shipment. The first-class ore was valued at \$22 and the second-class at \$15 per ton.

The railway siding was being constructed in October last, and, as soon as that and the shipping bins had been completed, shipments were to be made to the Canadian Smelting Co., at Trail, which had offered exceptionally good rates for the ore, as well it might, since it is admirably suited for a flux for the ores from Rossland.

Development. A single-compartment shaft was down 160 feet, and was about to be continued down further as a 3-compartment shaft, 11 feet by 16 feet. This shaft, together with a raise of 100 feet and some 2,000 feet of levels, constitutes the work done underground. The levels extend for a total length of about 700 feet.

The ore occurs in schutes, of which three, varying in width up to 28 feet of almost solid ore, have been developed.

The country rock is a diorite, very much cut up by "lime dykes," and occasionally by dykes of porphyry, which often come in horizontally, cutting off the ore abruptly in places, and forming regular floors.

The amount of ore blocked out was considerable, and there is every prospect of the deposit proving very extensive, but until the various dykes have been thoroughly studied, and are well known, it will be treacherous mining, and the ore can not be called "in sight" in this mine until it is actually blocked out, and in small blocks at that; the property is, however, one of the most promising in the District.

The plant at present is considered as merely a "prospecting outfit," and consists of Lidgerwood hoist, with suitable boilers; a 5-drill Rand compressor; 2 drills; pumps, &c., &c., all housed in a rough, but effective, shaft-house.

Oro Denero. This claim is also situated in Summit Camp, and directly on the railway, in fact one of the best surface showings on the property was disclosed by the railway cutting.

The property is held by the King Mining Co., of Rossland; Thos. Anderson, Secretary; Superintendent, Mr. O'Neil.

A very considerable amount of surface work had been done on the property, but as a heavy fall of snow lay on the ground I could only inspect certain places, and these not very satisfactorily, since the snow had to be brushed away to see the formation.

The formation appeared to be diorite, with dykes of porphyry and lime in considerable quantity occurring in small masses.

In some large trenches in the hillside exposures of several extensive, but irregular, ore bodies had been made, while some 200 feet further down still larger exposures had been made in the railway cut itself; indeed during the construction of the latter a number of tons of very good ore were taken out.

The ore consists chiefly of pyrrhotite, but associated with it are chutes and masses of chalcopyrite, occurring sometimes separately and sometimes disseminated through the ore bodies, and apparently directly associated with the dykes already mentioned.

The surface showings certainly give strong indications of ore in considerable quantity, but no ore body has yet been sufficiently prospected to determine its continuity. The ore carries gold in varying quantities, from very little in certain parts of the pyrrhotite up to about \$10 or \$15 per ton in other portions of the ore bodies.

The property is distinctly only a prospect, but one of some considerable promise.

Development. On the top of a high knoll, above and some 100 feet distant from all the showings, a shaft had been sunk about 225 feet, cutting through several dykes carrying mineral, although to no great extent.

At the 200-foot level a drift had been started north-east towards the showing in the railway cut, and was then in about 25 feet. It was calculated that this drift would be under the showing referred to at about 200 feet from the shaft.

The *Plant* consists of a 40-horse power boiler (wood burning), an Ingersoll hoist, Ingersoll air compressor and one drill, pumps, blacksmith shop, &c. In the valley below were suitable bunk-houses, &c.

WELLINGTON CAMP.

This is a Crown-granted property, owned by the Brandon and Golden Crown Gold Mining Company, of Rossland. Superintendent and manager, E. H. Collins, Greenwood; Al. Lynch, mine foreman. The plant consists of a 60 and a 35 horse-power boiler, 20 horse-power hoist, 4-drill Rand Compressor, pumps, &c., all suitably housed. Several quartz veins cut across the property, and on the most important of these a vertical shaft has been sunk for 300 feet. The vein referred to has a strike nearly east and west and dips to south at an angle of 20 feet horizontal for 100 feet vertical, the width of the vein ranging from a few inches up to 8 feet. Cross-cut levels to the south, from the shaft to the lead, had been made at the 100 and at the 150-foot levels, and at the 300-foot level drifts were being run both north and south, but had not, at the time, reached ore, having been driven only about 20 feet each way from the shaft. The shaft is 8 by 4 feet, with 2 compartments; it is timbered and provided with a small but well-equipped cage—the only one in the “Boundary.” Wooden cars were being used. Some 8 miners, 4 muckers and 5 surface men were employed, and 2 air-drills were at work.

The ore may be described as iron sulphides, carrying gold, with a small percentage of copper; there are several hundreds of tons on the dump. It would appear as though the copper values from the lower levels are less than nearer the surface, but the gold values are said to be well maintained, running as high as \$25 per ton on large samples.

In the cutting made for the railway, just above the shaft-house and near the *Winnipeg* line, a very considerable showing of ore had been exposed, carrying good values; this ore body apparently runs into the property, and development on it was just being begun, at the time of my visit. The property is worked in a small way, but seems to be one of the best managed in the District, some system being attempted in the workings and plant.

The *Winnipeg* is a Crown-granted mineral claim, with an area of 26.7 acres, lying to the south of and adjoining the *Golden Crown*, and owned by the *Winnipeg Mining and Smelting Co.*; D. McIntosh, of Greenwood, President and Managing Director; Treasurer, D. A. Beecher, Grand Forks, North Dakota; Secretary, W. F. Honey, Spokane, Wash.

The plant on this property consisted of one 60-horse power boiler, with suitable hoist; a 7-drill air compressor, &c., all suitably housed.

The main shaft was down some 300 feet, and at the 100-foot level drifts had been run for 200 feet and 75 feet on either side, while at the 200-foot level a station had been cut.

There appear to be two parallel leads on the claim, some 80 or 100 feet apart, having a strike N. 80° W. On one of these the main shaft is sunk, while on the other is a series of old workings from which some good ore has been taken, and in which quite a quantity, though not of so high a grade, still remains, some of it broken and some in place.

The ore is an iron sulphide with a small percentage of copper, and is said to carry fair gold values.

The showing of ore uncovered by the railway cutting, and already mentioned as being almost on the line between this property and the *Golden Crown*, seems to indicate a further ore body carrying a higher percentage of copper.

This claim is owned by the B. C. Rossland & Slocan Syndicate, Ltd., of London, England; A. J. MacMillan, Rossland, managing director; B. C. Murray, mine manager. The property is situated on the main waggon road, a mile or so east of the town of Phoenix, and very near the boundary line between the

Grand Forks and Kettle River Mining Divisions. The plant consists of a 40 horse-power boiler, a 20 horse-power hoist, 4-drill Rand air compressor, &c., together with suitable cabins, &c. An inclined shaft, dipping 50°, had been run down for 200 feet. At 100 feet down levels had been driven off, from which a cross-cut and upraise had been made. In the upraise a body of iron sulphide ore some 10 feet wide, and said to carry fair values, had been struck, but the extent of the body had not been ascertained. The main shaft seems to carry ore of low grade down to a depth of 110 feet, when it appears to cut off. A drift was being run at the 200-foot level, in the hope and expectation of meeting the ore body found in the raise on the 100-foot level.

OFFICE STATISTICS—GRAND FORKS DIVISION.

	Number.	Amount.
Mineral claims recorded	847	\$ 2,117 50
Certificates of work issued	970	3,242 00
Bills of sale, agreements, &c., recorded	637	1,673 30
Abandonments	22	127 50
Filings	275	68 75
Permissions to re-locate	3	7 50
Certificates of improvements	55	137 50
Water rights	2	
Free miners' certificates	892	5,987 00
Abstracts, &c.		139 10
Total amount paid in for twelve months		\$13,500 15

KETTLE RIVER MINING DIVISION.

LONG LAKE CAMP.

Jewel Group. Owners, the Jewel Gold Mines, Limited; Secretary, J. A. Allen, 15, Philpot Lane, London; Manager, Mr. Gilbert Mahon.

This group consists of the *Jewel*, *Gold Drop*, *Imperial Fraction*, *Massachusetts*, and *Denero Grande* mineral claims, situated in Long Lake Camp, and distant from the town of Greenwood some 8 or 9 miles, and from the Columbia and Western Railway, at Eholt Creek, about 4 miles, and having connection with both points by a good waggon road of easy grade.

The formation is granite, very much disturbed and cut up by porphyritic dykes.

The work has been practically all done on the *Jewel* claim, where a quartz fissure vein has been developed and shown to average about 4 feet in width. The strike of this vein is approximately north, varying 10° to east or west, and dipping to east at an angle varying from 45° to 60°. The mineralization of the quartz gangue consists of iron pyrites, with smaller quantities of galena and zinc blende, and carries values in gold.

The ore, as mined, will have an assay value of somewhere about \$10 per ton, although assays are reported as high as \$70 in gold and \$12 in silver per ton.

The main shaft follows the vein down for a distance of 234 feet, at an angle of from 40° to 45°. From the bottom of this shaft levels run to the north and south, the vein maintaining its width for about 100 feet on either side of the shaft.

In the south drift, the vein pinches at 100 feet in from the shaft, but, in the further 50 feet to which the drift had been run at the time of my visit, it seemed to be regaining its size, although, at the drift level, the mineralization did not seem to be so strong as it was nearer the shaft.

In the north drift, also at about 100 feet from the shaft, the formation takes a roll, disturbing the vein, which, although it continues on the further side of this disturbance, is not so strong or as well mineralized as previously. This drift is to be continued, however, with the expectation of cutting, at a depth, a very promising outcrop, presumably of the same vein, which occurs to the north-west of the shaft.

In the 120-foot level, drifts have been run to north and south. The south drift had been run for some 150 feet, and, at about 100 feet in, was connected with the 234-foot level by an incline, from the upper end of which a raise had been made for some 40 feet above the level. It is along this incline that the highest assays were obtained. The north 120-foot level had been run for some 140 feet, and had a short raise and a cross-cut at the inner end.

The roll mentioned as occurring in the 234-foot level is also noted in the 120-foot level, but is not so abrupt. It appears to have a south-east axis, and seems likely to disappear before reaching a lower level.

At the 50-foot level, a drift runs to the south for some 40 feet and one to the north for about 25 feet.

To sum up, the development consists of the 234-foot shaft already mentioned, some 600 to 700 feet of drifts and cross-cuts, and some 150 to 200 feet of raises and winzes.

The machinery and plant are good and sufficient for the property in its development stage; they are to be increased shortly, I was told.

The Company owns a millsite on Long Lake, some half a mile distant, where it is proposed to erect a mill for the treatment of the ore by cyanide process or by concentration.

There are some 500 or 600 tons of ore on the dump, which seems to have been systematically sampled, and, if it bears out on treatment the assay values given me by the manager, Mr. Mahon, would indicate that the property should prove to be a very profitable little mine.

The underground workings, taken together with the surface strippings, seem to prove that the vein will be found continuous for some distance, and, as depth is gained, it certainly is holding its own, if not improving.

The property is small but is well managed, and seems to me to be one of the most promising prospects of the Division, and likely to be among the first to yield a profit.

The *Enterprise*, *Anchor*, and *North Star* mineral claims lie to the north of the *Jewel Group*.

The *Enterprise* has a shaft begun on what is supposed to be a continuation of the *Jewel* lead.

DEADWOOD CAMP.

The *Mother Lode* is a 600 by 1,500-foot Crown-granted mineral claim, situated in Deadwood Camp, some three and a half miles from Greenwood, and connected therewith by a good waggon road.

The property is now owned by a New York company, the B. C. Copper Co., and is under the management of Mr. Frederick Keffer, M. E., of Greenwood.

The property was described in the Report of this Department for 1897, since when considerable development work has been done.

At the time of my visit, in October last, the main shaft was down some 280 feet, and was being sunk to the 325-foot level, where, I was told, drifts were to be started north and south.

At the 200-foot level a drift had been run to the north some 457 feet, and it was estimated that this tunnel, produced some 43 feet, would be in line with an incline being sunk from the old cross-cut tunnel, the incline being then down 100 feet.

This connection was to be made with all possible speed, and should ensure good ventilation, as well as an alternative hoisting shaft and exit from the mine.

As far as could be seen, these workings were almost entirely in the ore body—a zone of greenish volcanic rock, impregnated with iron and copper sulphides. The width of this zone appeared to be nearly 200 feet.

The present development has fully shown that the quantity of ore available is sufficient for some years to come.

The grade of the ore I was not able to determine, but was informed that a series of assays had been made, and that the copper contents ran about 3 or 4 %, with \$2 to \$4 in gold and silver.

Mr. Keffer was absent in New York at the time of my visit, and official figures were not obtainable from the foreman, but I should judge from the ore I saw on the dump that those given are very approximate.

As has been already noted, this Company is at present erecting a smelter at Greenwood for the treatment of the ore, and it should be in operation this coming spring (1900).

A "spur" from the railway at Greenwood was being built, thus connecting the mine dumps with the smelter site at Greenwood. The grading for this line was nearly completed last fall, and I understand that it is now entirely so.

The property is well equipped in every way, having two 60 h. p. boilers; one 10-drill Ingersoll air compressor; one double 8¼ by 10-inch Ingersoll hoist, dynamo, &c.

The timbering in the shaft is exceedingly good, and the quarters for men and foremen are a credit to the Company.

The *Morrison Claim* is owned by the Morrison Gold Mining Company.

Morrison Mine. President, George Crane, Spokane; Secretary and Manager, F. H. Oliver, Spokane.

This property is situated on the easily sloping bank of Copper Creek, directly on the waggon road from Greenwood, and distant from the latter town about three miles.

There are three mineralized zones or leads, running nearly parallel with the creek; these have been cut by a cross-cut tunnel run in from the creek level.

The first lead is cut at 90 feet in, and is about 12 feet wide; the second at 415 feet in, showing a width of some 5 feet; while the third is cut at 565 feet, and is some 70 feet wide, but of this width only a portion of some 20 feet would be worked. The tunnel at the face had gained a depth of 170 feet.

No drifting had been done on the first or third of these leads, but on the second a drift had been run to the right for some thirty feet, while to the left a half cross-cut from the tunnel, some 125 feet long, cut through the lead about 100 feet from the tunnel, and at this point a drift through barren limestone was being made to connect, it was said, with No. 1 shaft for purposes of ventilation.

These zones or leads are more or less mineralized with iron pyrites carrying, I was told by the management, from \$8 to \$10 in gold.



CITY OF PARIS AND CITY OF LINCOLN MINES—GRAND FORKS M. D.



CABIN, EARTHQUAKE MINE—N. F. KETTLE RIVER.



A small quantity of copper pyrites showed up at intervals, but I should estimate that it would not amount to more than 1 % copper on the average.

There are indications of very large, very low grade ore bodies, but the development has not as yet progressed far enough to prove them, either as to size or value.

An 80-horse power vertical boiler, an air compressor with four drills, &c., were being installed last Fall, and it was expected that when this was completed work would be pushed energetically.

This group, lying to the east of the *Mother Lode*, consists of the **Sunset Group.** *Sunset, Crown Silver, C. O. D., and Florence Fraction*, all Crown-granted mineral claims. The property is owned by the Montreal Boundary Creek Mining Co., Ltd.; capital, \$2,000,000; president, Hon. A. W. Ogilvie, Montreal; vice-president, W. B. Stephens, Esq.; secretary-treasurer, W. Jacques, Esq., 47 St. Francois Xavier Street, Montreal.

The development has been chiefly confined to the *Sunset* claim, although some prospecting has been done on the *Crown Silver*. The development on the *Sunset* consists of a cross-cut tunnel, said to be about 470 feet long, with drifts therefrom of a total length of some 200 feet. This tunnel starts in on the slope of a small knoll somewhat detached from the main range of hills. Higher up, on the other side of the knoll and near its summit, a shaft had been sunk, which is said to strike the tunnel at 100 feet depth and continue some 85 feet deeper. From this 185-foot level drifts have been run. The total development is said to be about 1,400 feet of drifts and levels, and some 260 feet of shafts and winzes.

In October last the Company was enlarging the old shaft and making it into one of two compartments, each compartment being 4½ by 5 feet in the clear. The timbering of the shaft was being done with squared 12 by 12 timbers, in an exceedingly good, though expensive, manner. Foundations were being levelled off for an extensive plant, which, I was told by the management, had been ordered, and consisted of two 80 h. p. boilers; one 20-drill Ingersoll duplex compressor; and one 75 h. p. Lidgerwood hoist, with 59-inch friction drum.

The re-lining of the shaft prevented my making any inspection of the underground workings, but the ore, judging from that on the surface, appeared to be similar to that of the *Mother Lode*, although not, I should imagine, as high grade in copper. The *Mother Lode* ore body is supposed to extend into this property, and such may be the case, although the geological conditions are not identical. This belief seemingly justifies the management in the erection of so extensive a plant as is proposed, as the latter is certainly in advance of the development of the property.

COPPER CAMP.

This property, said to be owned by Messrs. John Moran and McAuley, **Big Copper Claim.** is situated some six or seven miles from Greenwood, and is reached by a fair waggon road. The property has attracted a great deal of attention, and the work that has been done on it has shown up a most interesting "iron capping," of tremendous size, which occurs on the hillside and is from 100 to 125 feet across. It has been opened up for a length of some 500 feet. This "iron capping" seems to be a band of porphyry, heavily impregnated with iron oxides and sulphides, with a small percentage of copper occurring on the surface, in the form of the higher sulphides, oxides and carbonates, and said to carry low values in gold and silver. The porphyry occurs in contact with a crystalline limestone, and has been subject to a series of small vertical faults. As has been already said, the deposit is interesting and seems worthy of more serious investigation, although I was unable to learn of any ore taken from it that carried pay values.

King Solomon and *Copper Queen* are two mineral claims lying S. E. of the *Big Copper*, and owned by J. C. Corbin, of Spokane. These properties were reported on in 1897 by this Department. The shaft on the *King Solomon* is said to be down some 90 feet, but was flooded at the time of my visit. On the dump, however, were several tons of ore, consisting of rich oxides and carbonates of copper, indicating a body of high grade. So rich was this ore on the dump, that the shutting down of the property forces the inference that no quantity of it was found, which agrees with the information given me on the ground. The shaft is provided with a very complete hoisting plant, and it is to be regretted that further work is not being done, as, besides that actually found in the shaft, very fine ore is also exposed in an open cut.

KNOB HILL AND OLD IRONSIDES GROUPS.

These properties contain probably the largest and certainly the best known and most developed ore bodies in the District, and are regarded as typical of the ores and ore bodies of the "Boundary."

The two groups are under the same management, and are to all intents and purposes one property, being held by practically the same people—the Miner-Graves Syndicate—although nominally controlled by separate companies.

The *Old Ironsides* claim, 600 by 1,500 feet, is owned by the Old Ironsides Mining Co., Limited; J. P. Graves, President; S. H. Miner, Vice-President.

The *Knob Hill* mineral claim is held by the Knob Hill Gold Mining Co.; S. H. Miner, President; J. P. Graves, Vice-President.

The Granby Consolidated Mining and Smelting Co., of which S. H. Miner is President and J. P. Graves is Vice-President, owns the *Ætna*, *Victoria*, *4th July*, and *Phoenix* mineral claims.

All the claims are under the management, as general superintendent, of Mr. W. Yolens Williams, and are worked in accord, using sidings, shafts, etc., in common. The properties are situated in Greenwood Camp, some three miles from Greenwood, on the head-waters of Twin Creek, near the summit of the divide between the watersheds of Boundary Creek and of Fourth of July Creek, and, together with the adjoining properties of the Dominion Copper Company, form the nucleus and reason for the existence of the town of Phoenix.

The main ore body has been shown by development to run pretty well the length of the two properties (*Knob Hill* and *Old Ironsides*), and to have a width of from 70 to 180 feet, while it has been proved to a depth of some 300 feet by shafts and drifts. These figures indicate an ore body of rather startling dimensions, but I think the development has fully established their correctness.

This ore body may be best described as a huge mineralized zone of fine-grained, eruptive rock, highly altered, and occurring near a contact with limestone. Through this rock is disseminated yellow copper sulphides, magnetite, and magnetic iron pyrites, with small stringers of calcite, while, occasionally, the iron sulphides and oxides become massive.

While the whole of this ore body is found to be mineralized, it must not be understood that it is all sufficiently so to constitute pay ore. Certain parts of it are so poor as to be classed as "barren," although a very considerable portion will produce an ore running from 2 to 5% copper and about the same figures in dollars per ton in gold. The quantity of ore in sight is certainly very great, enough to admit of the installation of the best labour-saving appliances, which, however, have not as yet made their appearance, the Company probably wishing to prove, by actual test, the value per ton of the ore, which cannot be so satisfactorily done by any system of sampling.

I have availed myself of certain published extracts from the report of Mr. Williams, general superintendent, to his Directors, for further estimates as to ore in sight and assay values.

The following is published from the report of Mr. Williams:—

“On the *Old Ironsides*, over 2,500 feet of development work has been done. No. 1 Shaft is down 210 feet and No. 2 Shaft 300 feet, and, on the latter, sinking is being continued to the 400-foot level. The two shafts are already connected at the 200-foot level by a 320-foot cross-cut, which runs through a 90-foot ore body. At the 200 and 300-foot levels, there are over 1,600 feet of drifts and cross-cuts. The average cost of drifting per foot has been \$19.44½, and of sinking \$36.80.

“Shaft No. 1 is situated near the centre of the claim, both in length and width. The shaft was started near the discovery of the claim, and was sunk in the ore to the depth of about 80 feet, at which point it passed through the ore into the footwall. Sinking was continued to the depth of 210 feet from the surface. A level was started at the 200-foot mark, and a cross-cut run in an easterly direction. The ore body was encountered at a distance of about 40 feet from the shaft, and the cross-cut was continued to the side-line of the claim, demonstrating the width of the ore on that level to be about 80 feet, and the rest of the material passed through was heavily mineralized, but carried no values of any consequence.

“No. 2 Shaft was sunk on the east side of the claim, and was continued down 200 feet, and intersected the cross-cut previously referred to. This shaft answered a double purpose, that of ventilating the mine and furnishing an additional exit to the surface.

“The general indications are that the ore in this mountain is almost inexhaustible, and it has been satisfactorily demonstrated that the grade of ore improves with depth. Assays showing values of upwards of \$100 per ton have been obtained on the 200-foot level. The bulk of the ore for a distance of 80 feet yields a general average of \$15 per ton, but by selecting the ore a much better average could be obtained.”

Knob Hill. The *Knob Hill* property is at a higher level, and is developed exclusively from tunnels.

“The tunnel enters the claim at its extreme north end boundary, and runs diagonally across it for a distance of 634 feet, at which point the east side-line is reached. The course of the tunnel was changed at that place to conform with the direction of the side-line, which is also in conformity with the general trend of the ore body.

“The main tunnel was extended 550 feet during the year, making its entire length 985 feet to date. In addition to the extending of the tunnel, there was also 904 feet of drifting and cross-cutting done, making an aggregate of 1,454 feet of tunnelling for the year. There were 277 feet of sinking and 65 feet of upraising made, which brings the total number of feet to 2,348. The above developments represent in round numbers the blasting and breaking of 84,000 cubic feet of solid ground, and the handling and removal of 7,000 tons of material.

“A cross-cut was made to the west and east at a point in the tunnel 366 feet from the mouth, for the purpose of determining the width of the ore body and to locate its western boundary or footwall, which was done at a distance of 168 feet from the main tunnel, and the width of the ore body was proven to be fully 200 feet at right angles to its general trend. Drifting was done along the footwall for a distance of 189 feet, and another cross-cut made from the face to intersect with the main tunnel again, a distance of 221 feet, thus blocking out a piece of ground approaching 200 feet square.

“A connection was made to the surface from the first cross-cut mentioned, for the purpose of better ventilation, and also to prospect the ground between the surface and the level of tunnel, a distance of 135 feet vertically, which was proven to be all solid ore.

“Another connection to the surface is now being made about 500 feet further in the tunnel. A shaft has been sunk from the surface to a depth exceeding 100 feet, and will be continued until the connection is effected with the upraise now in progress, which should be done early next month. This work is intended to serve a double purpose of affording better ventilation and to prospect the ground in the same manner as the other surface connection above referred to. This will supply sufficient ventilation to enable us to continue the main tunnel to the extreme south end of the claim, a distance of about 500 feet, without having to make another air connection to the surface.

“A winze is being sunk in the east cross-cut at the 336-foot station in the tunnel, which had attained a vertical depth of 100 feet from the tunnel on January 1st. The results obtained in this winze from the beginning have been exceedingly satisfactory, having been in solid clean ore the whole distance, and showing no signs of giving out. It was supposed at the time the winze was started that the hanging wall on the eastern boundary of the ore had been encountered, and it was the intention to sink along the wall and to follow the dip, but a little preliminary work there convinced me that the hanging wall had not been encountered, as good ore was found to exist back of the supposed hanging wall, a very few feet below the level. This discovery was the cause of changing to sinking vertically, instead of on an incline as at first proposed, hence it can be seen that the winze is not following any wall, but is penetrating into the ore body. It is simply a matter of conjecture as to how far we can continue sinking in the present way before encountering the footwall. This depends entirely on the dip from the level down. It is hardly probable that the footwall will be reached within less than 200 feet from level, and possibly not for 300 feet. Of course it will not make any particular difference in the results when or where it will be found; it will simply necessitate changing the angle of the winze to conform with it and to follow it downward. It is the intention to eventually intersect this winze with the *Old Ironsides* south drift on the 200-foot level.

“For the purpose of furnishing you as complete and reliable a statement in this report as possible, I have had samples carefully taken of the ore throughout the length of the *Knob Hill* tunnel. The samples were taken in 10-foot sections, including both sides of roof and tunnel, each sample representing from 400 to 500 pounds in weight, which should give a very accurate average of the value of the ore sampled. The assay returns were as follows:—

From mouth of tunnel to point 387 feet, total average value per ton,	\$ 6 50
From 660 feet point to 936 feet, total average value per ton	10 24
General average value per ton of the whole	8 37

“From the above returns I arrive at the following conclusions as to the value of ore in sight in the mines and extracted on the dump:—

Quantity of ore on dump, tons	4,863
Deduction for moisture, 10 p. c.	486
Actual weight of ore on dump, tons	4,377
Total value per ton	\$8 37
Total value of ore on dump	\$36,635 50
Ore in sight above tunnel, tons	1,537,333
Deduction for moisture, 10 p. c.	157,333
Actual weight, tons	1,416,000
Value per ton	\$8 37
Total value of ore in sight (gross value)	\$11,851,920”

DOMINION COPPER COMPANY.

This Company owns the *Brooklyn*, *Stemwinder*, *Idaho*, *Rawhide*, *Montezuma* and *Standard Hill* properties.

The President of the Company is the Hon. G. A. Gox, and among the Directors are Messrs. McKenzie & Mann, of Toronto. Mr. Hugh Sutherland is Managing Director, and Mr. Frank C. Robbins is Manager.

Speaking generally, the ore bodies on these properties are of the same character as those of the *Knob Hill* and *Old Ironsides*, although from such development as has been made they have not been proved to be as extensive or as regular.

The main shaft was down at the time of my visit some 238 feet on an **Stemwinder.** incline of 75 to 80°, and was in ore most of the way. At 114 feet down a cross-cut had been run for some 114 feet, from which a drift had been made to the left for 62 feet, and from this drift a short cross-cut of 12 feet.

The main cross-cut developed two ore bodies, one 18 feet wide and the other 30 feet. The ore is said to run from 3 to 5 % copper, and from \$3 to \$8 in gold, with a little silver.

The plant consists of a 6 by 12 Cooper hoist, geared 5 to 1, boiler, &c., &c., together with suitable cabins, assay office, &c. Nine miners were employed.

The *Brooklyn* has an incline shaft down 262 feet. At the 150-foot **Brooklyn.** level there is a cross-cut of 100 feet in mineralized matter, of which 20 feet on the foot-wall, and about 20 feet elsewhere, is said to be "pay ore." From this cross-cut there was a foot-wall drift of 155 feet and a No. 2 drift in some 58 feet. At the 250-foot level there is a 150-foot cross-cut.

Assays are about the same as those of the *Stemwinder*, although rather lower in copper and higher in gold.

This claim is supposed to have the extension of the *Brooklyn* lead **Idaho.** running through it, but has as yet only been developed by superficial work, which, however, shows up some large surface ore bodies. There was a 50-foot shaft, but it was not in a condition to be seen.

Standard Fraction lies between the *Brooklyn* and *Stemwinder*, and has a shaft of about 40 feet.

Montezuma was located in 1899; it is supposed to have an extension of the *Stemwinder* lead, the ore being of the same class. Assessments only have been done on the property.

This claim, in addition to surface work, has two short tunnels and **Rawhide.** one of 400 feet run to tap the lead at 160 feet depth, which, I understand it has not yet succeeded in doing.

Golden Eagle is owned by D. Mann; three assessments have been done on the property, which has as yet only developed some small showings of ore.

This group consists of *Gold Drop*, *Gold Drop Fraction*, *Nugget* and **Gold Drop** *Phillipsburg Fraction* mineral claims, and is situated just off the main stage **Group.** road from Greenwood to Grand Forks, about a half mile above the town of Phoenix. The property is owned by the Gold Drop Mining Co., of Montreal. Thos. C. Brainard, President; Superintendent of Mine, S. A. Easton.

The country rock here is much disturbed and cut up with dykes and intrusive igneous rocks, some of them horizontal, and it is upon these dykes that the ore seems to lay. The ore is that of the camp, carrying 2 to 3 % copper, 1 to 2½ ounces silver, and from \$3 to \$10 in gold.

The development was entirely by tunnels. The longest of these is one of 170 feet, which was run in on ore laying on a floor of dyke matter which sometimes came up into the tunnel, but, eventually, this floor disappeared, the tunnel continuing in ore and cutting through a seeming "horse," but being again in ore at the face. Another tunnel, some 200 or 300 feet to the east, was in 130 feet, with a branch of 30 feet, and showed a considerable quantity of ore.

The property was equipped with a good office, Superintendent's quarters, &c., and I was told that it was the intention of the Company to shortly install power drills.

The property is a small one, and is yet very decidedly in the prospect stage, but the management is well worth the attention of some of the larger companies.

This is about the only property in the District where I found detailed, large scale plans kept of the daily progress of the workings, and in which any serious attempt was made to sample every car of ore coming out of the workings, and keep assays up all the time.

The management had also experimented in the mine with drilling "single-handed," and, finding the results better and cheaper than by the usual "double-handed" system, had adopted this method.

These few "straws" show that more than the ordinary intelligence is being brought to bear by the management, and the company is to be congratulated accordingly.

OFFICE STATISTICS—KETTLE RIVER DIVISION.

	1898.	1899.
Number of free miners' certificates	700	1,467
" special free miners' certificates		12
" location records	581	791
" certificates of work	542	712
" conveyances and agreements	403	497
" certificates of improvements	44	57
" abandonments	57	50
" water grants	5	15
" permits to re-locate	3	..
Revenue received for free miners' certificates (1899)		\$6,963 98
Revenue from mining receipts (1899)		7,276 45

OSOYOOS MINING DIVISION.

REPORT OF JAS. R. BROWN, MINING RECORDER.

During the past year this Mining Division has steadily progressed. The particular features of improvement are in the amount of prospecting done in the Keremeos District, and on the West Fork of the Kettle River, as well as the solid development done in and about Camp McKinney, which has shown up so well, and thus encouraged the investment of capital. I give below a short account of the work done and descriptions of the various camps.

CAMP MCKINNEY.

The Sailor Consolidated Mining and Milling Company, Ltd., owns the Sailor *Sailor, Rover Fraction, Alic Fraction, Bellevue, Bellevue Fraction, Snowshoe, Diamond and Toledo* mineral claims. On the *Sailor* the main shaft has been sunk for 87 feet, at which level a cross-cut was run north, cutting through a 12-foot vein and continuing north for 45 feet. A sump was put in to catch the

surface water, and drifts were then run east and west along the vein. The east drift is now in 75 feet, the quartz averaging about 4 feet in width, of a bluish white colour, carrying pyrites, galena and zinc blende.

In the west drift, which is now in 45 feet, the quartz is bluish white, and at first was mixed with considerable gangue, but is now becoming more defined, and carries pyrites and galena. A cross-cut was run about 33 feet to the west of the shaft to cut the foot-wall, and the ledge at that point was found to be 12 feet wide.

Further sinking will be done, and when the 150-foot level is reached the vein will be again cross-cut and drifted upon. If the showing at this lower level is satisfactory, a 10-stamp mill will be erected. The plant at present consists of a "Jencks" 6 by 8 hoisting engine, No. 5 Cameron pump, Rand steam drill No. 3, and a Peerless drill. The necessary buildings have been erected. On the other claims of the Company but little work has been done.

Owned by the Minnie-ha-ha Gold Mining and Milling Company, Ltd.,
The Minnie-ha-ha consists of the *Minnie-ha-ha*, *Cariboo Fraction*, and *Golden Crown Fraction*
Group, mineral claims. The president of the Company is Prof. Montgomery, of Toronto. The work done consists of a working shaft 190 feet deep, with cross-cutting and drifting at the 90-foot and 190-foot levels, and two upraises, being a total of 450 feet of drifting and cross-cutting. The mine is equipped with a five-drill compressor, four air drills, and double cylinder steam hoist.

Is owned by the Waterloo Mining and Milling Co., Ltd., which has
The Waterloo put in a stamp-mill (5 stamps), with concentrator, a steam hoist, and a pump. The character of the ore is free-milling and concentrating, running about the same value as that of the *Cariboo*. As the mill has only been running a short time, no returns are yet available.

The Cariboo-McKinney Gold Mining and Milling Co., Ltd., owns the
The Cariboo. *Cariboo* and other claims. R. Jaffray is president, and G. B. McAulay managing director. The year's work consists of drifting on the second level for 210 feet, on the 3rd level for 540 feet, and on the fourth level for 700 feet, a total of 1,450 feet. Raises have been made from the second level 155 feet, third level 170 feet, and from the fourth level 200 feet, a total of 525 feet.

Output :—

Tons of ore stoped and milled.....	12,670
Ounces of bullion produced, 9,570 @ \$13	\$ 124,410
Tons of concentrates produced, 542; value.....	22,000
	\$ 146,410

Number of stamps working, 20; number of men employed, 50.

This claim is owned by the Camp McKinney Development Co., Ltd.,
Warton. which has sunk three shafts, respectively 52 feet, 53 feet, and 60 feet, and has done 89 feet of drifting. The vein appears to be about 3 feet wide, and of the same character as the *Waterloo* and *Cariboo*, between which claims the property is situated.

The *Banner* and *Granite*, owned by the Camp McKinney Mines, have had a good deal of work done on them, and a five-stamp mill and concentrator, which have been running for some time with very satisfactory results, have been erected, but I have not been able to obtain accurate returns.

The *Pandre* mineral claim, owned by Stephenson & James, has two shafts on the vein, 35 and 30 feet respectively, and several test pits sunk along the lead, which is traceable for 700 yards, having an average width of 2 feet, containing free gold, sulphurets and galena, and assaying very high.

The *Kamloops* mineral claim, owned by the McKinney-Kamloops Mining Co., has one working shaft 70 feet deep, 1 shaft 40 feet, on the vein, and two prospecting shafts of 12 and 15 feet, respectively. The mine is equipped with steam hoist, pump, two machine drills, and a 35 h. p. boiler.

Owned by Fontenoy Gold Mining and Milling Co., Ltd., Victoria;
Fontenoy, Jas. Dunsmuir, president. No. 1 shaft is 120 feet deep, and from it a drift has been run for 180 feet. No. 2 shaft is 65 feet deep, with a drift of 18 feet. The mine is furnished with steam hoist and pump, a steam drill, and a 35 h. p. boiler. The *Fontenoy* lies east of the *Waterloo* mineral claim.

The Lemon Gold Mining Co., of Omaha, Nebraska, U.S.A., is working principally on the *Gold Standard*, and has an incline shaft 210 feet deep, while a drift on the lead, at the 125-foot level, has been driven 165 feet, and one on the 210-foot level about 90 feet. A ditch has been constructed, about 2,120 feet long, to carry water from Rock Creek. The mine is equipped with steam hoist and pump. A 5-stamp mill is now on its way and, on its arrival, will be at once erected.

The Little Cariboo Mining and Milling Co. has on one of its properties, the *Annie L.*, sunk a shaft 74 feet on the vein, which is 5 feet wide. At the 70-foot level, a drift has been run 165 feet. Values run from \$8 to \$40 in gold. Six men are now employed, and a steam hoist is to be installed at once.

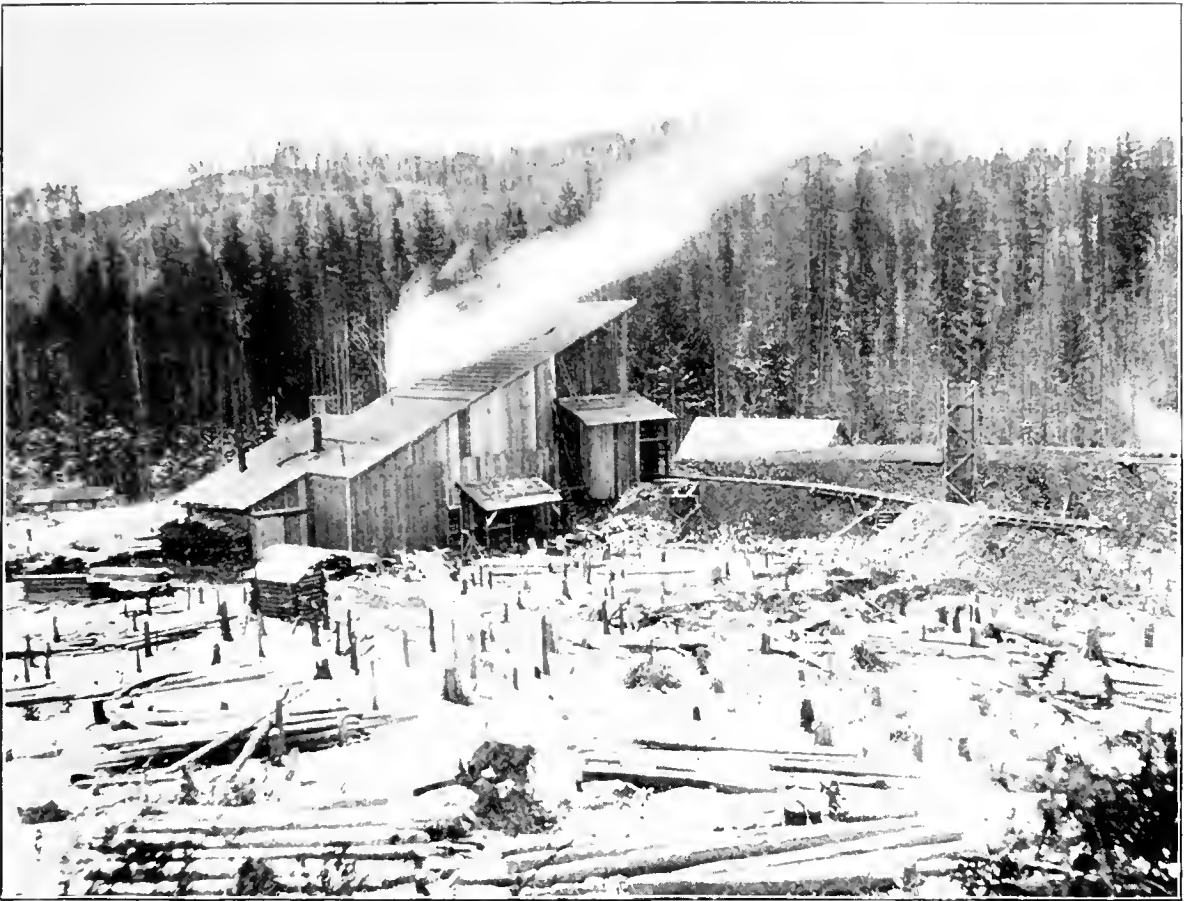
The *Shannon* and *Dolphin* mineral claims are owned by the Shannon-Dolphin Gold Mining Company. On these properties, a tunnel, 280 feet long, has been run to cross-cut the ledge at a depth of 320 feet. On the ledge, which is from 1 to 5 feet wide, a shaft has been sunk for 28 feet, and is still being continued. The ore assays, on an average, \$14 in gold.

The *Mammoth* mineral claim has a tunnel 85 feet on the ledge, which is well defined and from 3 to 6 feet wide, carrying iron sulphides and galena, with gold, and running in value from \$4 to \$200 to the ton. There are 4 men at work.

A very rich strike of free gold ore has been made recently in a claim called the *Dayton*, situated between the forks of Rock Creek, about 4 miles east of Camp McKinney, the assays going as high as \$80 in gold to the ton. It has been surmised that this section will prove equal to the old McKinney Camp, as the values are generally higher and the whole district is well mineralized. It is supposed that the numerous placer bars in this part of Rock Creek have been fed by the gold from the decomposed quartz on this claim, as no placer ground of any value has been found in this vicinity above the Falls, in fact none above the *Old England* mineral claim, which is situated near a part of Rock Creek from which several thousand dollars have been taken out in the last few years. The trend of the vein appears to be north-westerly and south-easterly. There are a number of locations in this camp, more or less developed, and the coming Spring is likely to see a considerable movement here.

CAMP FAIRVIEW.

The *Stemwinder* is owned by the Fairview Corporation, Limited
Stemwinder. President, Judge Spinks, of Vernon; Managing Director, R. Russell.
 During the past year, work has been constantly going on on this claim. About the 1st of March, the vein was struck on the second or 175-foot level. On the main



“B. C.” MINE—GRAND FORKS, M. D.



OLD IRONSIDES AND KNOB HILL MINES—KETTLE RIVER M. D.
(FROM BROOKLYN ASSAY OFFICE.)



vein, which is 20 feet wide at this level, 780 feet of drifting has been done during the year. This drifting showed an unbroken ledge for the entire distance. A raise to the first level, at a point 150 feet west of the shaft, is also entirely in ore. A cross-cut of 185 feet, made on this level to tap the south vein, has not yet reached it. A cross-cut of 86 feet has been run, which tapped the north vein at a depth of 200 feet, disclosing a body of ore about 7 feet wide. One hundred feet of drifting has been done on the vein at this level, proving it to be about the same as in the first level. The drifts in the first levels have been continued about 100 feet during the year.

An average sampling of the mine, made by Joseph J. Taylor, examiner of the Gooderham-Blackstock Syndicate, shows the value of the ore to be \$5.36, an average of 132 assays on samples from all parts of the mine. A mill test on 353 tons from different parts of the main ledge gave an average of \$5.46 per ton. The Company is now preparing to sink the main shaft to the 300-foot level.

During the year, the Company owning this mine has driven the main
The Smuggler. tunnel ahead about 30 feet, and has made an open cut on the surface exposing good ore for 20 feet. No work is now being done on the property.

The Dominion Consolidated Mines Company owns the *Dominion, Ada, Black Hawk, Flora, Virginia, Western Hill*, and other claims. The work this year has been chiefly done on the last three claims, which the Company acquired less than a year ago. These claims lie north-west of the *Stenwinder*, and are on the main vein of the Camp. There is now a shaft down about 100 feet, and a good deal of test sinking and drifting has been done, in all about 500 feet. A compressor plant for 6 drills is now on the ground, and is being erected; the necessary buildings have been put up; water rights have been obtained for water from the Okanagan Falls, and it is the intention to generate power to work the mine machinery. At present the vein is showing very strong, and average assays give about \$7 in gold. Work is being pushed on, and it is intended to sink to the 600-foot level and run drifts at every 100 feet.

LOWER KEREMEOS.

Consists of the *Bullion* and six other mineral claims. The principal
The Bullion outcropping is on the *Bullion*, and shows a large dioritic dyke having an
Group, iron capping of over 100 feet in width, well impregnated with copper sulphides. A tunnel, to be 700 feet long, is now being run, which is expected to cut this ore body at a depth of 700 feet below its apex, and which is now in about 120 feet.

The *Searchlight* has large surface showings of mineral, principally of magnetic iron, more or less impregnated with copper. A tunnel to cut the ore body is now in progress, and is in about 30 feet. Three open cuts have also been made, exposing good mineral bodies.

South of the *Searchlight* is Opulence Mountain, on which is the *Opulence* mineral claim, the *Swansea, Shamrock* and others. On the *Opulence* a shaft 45 feet deep has been sunk through a body of diorite, which seems to be strongly charged with native copper, and also shows some sulphides.

The *Dolphin*, on the same mountain, has a tunnel over 100 feet long, cutting a body of copper sulphides of excellent quality, from which good assays have been obtained.

The *Elkhorn Group*, lying on the west side of Keremeos Creek, near the mouth of Olalla Creek, consists of the *Elkhorn, Surprise, Echo, Iron King, Homestead* and other claims. On the *Surprise* a tunnel has been run for a distance of 110 feet on a vein, from 2 to 3 feet wide, of mixed calcite and quartz, carrying a heavy streak of copper sulphides and iron pyrites. Open work on the claim has exposed copper ore of good grade.

Half a mile south of these claims is the *Copper King*, which has a large surface showing of mineral, and a tunnel is being run to cross-cut the ore body. The ore is magnetic iron, with bunches of copper. Below this claim lies the *Golconda*, on which a tunnel is now in about 160 feet, 30 feet of which is in good ledge matter.

The *Something Good*, owned by Naden & Webster, lies lower down the valley, and a tunnel has been run on it for about 80 feet.

The *Roadside*, owners, Mangott, Shatford & Coutney, has a shaft down 25 feet, and another 12 feet, as well as several open cuts, which show very good copper ore, assaying about \$7 in gold.

UPPER KEREMEOS.

This is a heavily mineralized and very promising section, containing large ore bodies. Round Fish Lake many claims have been located, and on Green Mountain, north of Keremeos Creek, there are some very good prospects. The *Black*, *Alfred* and *Green Mountain* mineral claims have large exposures of ore, consisting of pyrrhotite, carrying copper and gold in fair values. On these claims development is now starting, and the proprietors intend doing a great deal more in order to prove the properties.

On Shingle Creek, and on Cedar Creek, are many good locations, and on the summit between the headwaters of these creeks and 16-Mile Creek some very promising groups of claims have been located, but too late in the year to have much development done as yet.

The chief obstacle to development in all the Upper Keremeos District is the want of a good trail, or waggon road, to get supplies in. A good waggon road, I understand, could be made from the summit mentioned above to the present Keremeos-Creek road at no great expense, and this would certainly help the miners very much.

WEST FORK OF KETTLE RIVER.

In this section a great improvement has been made by a Government waggon road being built up the valley, and on its completion development of the various locations will no doubt take place. This year, it is true, there have been a great number of locations made in excess of the previous year, but there has been very little more than assessment work done on the older claims.

OFFICE STATISTICS—OSOYOOS DIVISION.

	1898.	1899.
Number of Free Miners' Certificates	344	433
" location records (mineral)	496	1,053
" placer records or re-records	5	5
" certificates of work	351	454
" certificates of improvements	28	15
" conveyances and agreements	210	351
" abandonments	22	21
" permissions to re-locate	4	<i>Nil.</i>
" filings	97	<i>Nil.</i>
Abstract of revenue—		
Free Miners' Certificates	\$2,806 00	\$3,015 75
Mining Receipts, general	3,023 45	5,479 10
Total	\$5,829 45	\$8,494 85

VANCOUVER ISLAND AND COAST.

—o—

ALBERNI DISTRICT.

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REPORT BY H. CARMICHAEL, PROVINCIAL ASSAYER.

To Provincial Mineralogist :

SIR,—I have the honour to submit the following report on the mineral deposits and the progress of the development of the mineral claims in the Alberni and West Coast, V. I., Mining Divisions, visited by me, under instructions, during the months of August and September of last summer (1899), noting more particularly such development as has been accomplished since Mr. Carlyle visited and reported on this section in 1896, on which visit I accompanied him.

These two Mining Divisions comprise all the western water-shed of Vancouver Island, from and including the drainage area of the Alberni Canal and Barclay Sound to the extreme northern end of the Island.

The marked topographical features of this coast are, first, the long arms of the sea, or canals, as they are called locally, which indent the whole coast line, extending in for 40 miles, in some instances, and having numerous branches ; and, secondly, the mountains, which rise abruptly from the water's edge to heights of from 2,000 to 4,000 feet, leaving little level ground save narrow strips along some of the river valleys.

The arms or canals are almost invariably very deep, the shores being composed of rock, which extends down below the water at as steep an angle as it rises above it, rendering navigation possible, even for large boats, to their extreme limits, and, at the same time, rendering anchorage or camping places hard to obtain. All this is well indicated on the Admiralty charts, with which anyone going into the District should be provided. In this way almost any point in the whole section is accessible to within a short distance by boats, by means of which prospectors have been able to penetrate considerable distances inland. What the horse is to the prospector of the interior, the boat is to his fellow of the coast, and little more care is taken in the selection of the latter than of the former. Sealing boats and siwash canoes are now in common use, neither being very suitable.

The boat for the purpose must be seaworthy, in order to stand the sudden squalls which sweep down the narrow valleys, large enough to act as a base of supply, strong enough to stand the usage it is likely to get, light enough to be rowed fairly easily against a tide way (for the wind often fails in these narrow gorges), and, withal, able to sail fairly well—a design, I admit, not easily to be realized within the limit of the ordinary prospector's pocket.

This accessibility of all points by navigable waterways has an important bearing on the value of the mineral deposits and renders claims valuable here, which elsewhere, without such transportation facilities, would be worthless.

A passenger and mail stage runs twice a week from Nanaimo, on the E. & N. Railway, to Alberni, at the head of the Alberni Canal, from whence other points on the canal are reached by small steamer or boat. In summer the Canadian Pacific Navigation Co. gives a weekly

service to Alberni and Clayoquot, and a monthly service to points further north, the service continuing through the winter, but at longer intervals. Alberni is also connected with Nanaimo by telegraph.

With the exception of a little work on Quatsino Sound, development has as yet been confined to the vicinity of Alberni Canal and Clayoquot, little or nothing having been done north of Sydney Inlet.

The country rock of both the Alberni and West Coast, V. I., Mining Divisions might be described generally as "traps and greenstones," as Dr. Dawson describes the rocks at the north end of the Island, broken at intervals with large areas of highly crystalline limestone. These igneous rocks would appear to be diabase, with incidental diorite, and intersected with small seams of calcite. The ore-bearing matter apparently occurs in two distinct forms:—First, as quartz veins traversing the igneous rocks, not necessarily adjacent to or having any relation to any contact with other rocks. Second, as heavy sulphide deposits of iron and copper, at or near the contact of the igneous rocks with the crystalline limestones, and impregnating these rocks for some distance from such contact.

These quartz veins appear—on the surface, at least—to be very continuous, being traced in several instances for long distances. Whether they are as persistent vertically, is a question which development alone will satisfactorily settle, and that still remains to be done, for no serious depth has been attained in any of the properties as yet. It must be admitted, however, that such few of the quartz veins as have been exploited by underground workings to any extent have not shown such persistence with depth as might be desired. On the surface the values are good and the walls well defined, with a marked gouge; yet, usually, when followed downwards, the values become less, while the veins pinch and become frozen to the country rock, into which latter the vein-matter gradually blends.

The values in these veins are almost entirely in gold, with a little silver, and occur in iron sulphides scattered through the quartz. In some instances, free gold has been found in the quartz near the surface, but it is probably the result of the oxidization of the sulphides. The sulphide deposits at or near the contacts are usually massive, with a sharply defined but irregular contact with the igneous rocks. The values are chiefly in the copper contacts, there being but little silver or gold present, except in isolated cases.

ALBERNI MINING DIVISION.

CHINA AND HIWATCHES CREEKS.

DeBeaux Hotel, situated where Mineral Creek flows into China Creek, and some 10 miles distant, by a good waggon road, from the Alberni steamer landing, is the most central point from which to begin the examination of properties on these two creeks.

This group consists of the *Thistle*, *Pansy*, *Rose*, and *Anderson*, four
Thistle Group. full-sized locations, the first three having been surveyed. The owners are A. Watson *et al.*, Alberni.

This property may be reached from DeBeaux's by a trail $5\frac{1}{2}$ miles long, or from the Alberni Canal, at the mouth of Hiwatches Creek, by a trail 9 miles long, which follows up that creek and continues up its North Fork, rising gradually till an elevation of 3,000 feet above sea level is reached. Good cabins and bunk-houses are located at the head of the trail. Development work has been confined to the *Thistle* claim.

About 270 feet above the mine buildings, and exposed by a small open cut and stripping, there is a good showing of ore some 6 to 8 feet wide, and having, for the short distance it is visible, what appear to be well-defined walls. The strike of the lead is here about N. 80° E., or parallel to the general direction of the mountain side, the dip being vertical.

The ore body is nearly solid iron and copper pyrites, intermixed with fine-grained diabasic rock matter. The walls, to which the ore body is "frozen," are of the same character of rock, somewhat mineralized near the contact. The outcrop has been traced for some little distance on either side of the open cut mentioned.

Some 40 feet lower, a tunnel has been driven in 65 feet, and, apparently, should have tapped the surface ore body, had such body continued downwards as the surface work seemed to indicate it should. However, as the ore was not struck in the tunnel, it presumably has either faulted or pinched out, though sufficient work has not been done to prove this as yet.

Some 110 feet above this outcrop there is a second outcropping, covered with 6 to 8 feet of typical "gossan," and, from what little work has been done, it would appear as though the strike was the same as that of the lower exposure, although the dip is flatter and more into the mountain. A few shots which were put in here, and a 6-foot pit, show very good ore, though in the latter it seems to be cut off by a trap dyke. The ore is similar to that of the first outcropping, but with some bornite present, and possibly with quartz replacing some of the diabasic rock matter. An attempt, which failed, was made to cut this outcrop at a depth of 50 feet, a tunnel being driven some 90 feet through a light-coloured, felsitic rock, with finely disseminated iron pyrites.

Still a third outcropping is exposed some 80 feet above these second workings, showing ore of similar character. The work done is not sufficient to prove the extent or permanence of the ore body.

The gold values seem to run with the iron pyrites rather than with the copper, selected samples having given as high as \$30 to the ton.

The property is well provided with timber and with water power.

Maple Leaf. This claim is situated on the south slope of Douglas Mountain, about three miles from DeBeaux's.

There is exposed on the surface a 15-inch quartz vein, with well-defined walls, cutting through a diabasic rock, having a strike north-east and south-west, and dipping at an angle of 55° to south-west. A small shaft has been sunk some 10 feet on the footwall.

At the surface the vein does not seem to carry values, but, towards the bottom of the shaft, copper pyrites, carrying a small amount in gold, appear.

Golden Eagle. This claim is situated at the head of China Creek, and was fully described in the Report of the Minister of Mines for 1896, since when nothing further has been done on the old workings, snowslides so seriously interfering with the operations there that it was deemed advisable to run a long tunnel lower down out of harm's way, and thus tap the vein at a depth.

At the time of my visit this tunnel was being driven, and was then in some 530 feet, but it had still a considerable distance to go before it could be expected to reach the vein.

The tunnel has been run through a fine-grained diabasic rock, no vein or ore body being visible in its entire length.

Nahmint Mine. The *Nahmint*, or, as it is commonly called, the *Hayes* mine, is situated on McIntyre's Mountain, on the N. W. side of the Alberni Canal, and some 14 miles from Alberni.

The group consists of *Three Jays*, *Three Jays No. 2*, *Three Jays No. 3*, *Blue Jay*, and *Three Jays Fraction*, is owned by the Nahmint Mining Co., of Portland, Oregon, and is under the management of Col. Hayes.

At Hayes Landing, just below the mine, the Company has built a substantial wharf, suitable for the largest vessels, and has brought fresh water for the use of shipping on to this wharf by a pipe.

Adjacent to the wharf has been erected a comfortable house for the manager, with office and stables.

From the landing a waggon road, two miles long, ziz-zags up to the mine, ascending in that distance 1,700 feet. At the mine have been erected suitable bunk-houses, &c.

The property had been developed by three tunnels driven directly into the mountain, and known as Tunnel A, No. 1 and No. 2; also by two shafts and some surface stripping.

Surface workings had disclosed a fine body of copper pyrites and oxides, some 18 feet across, and carrying a little gold and silver. To prove this ore body the Tunnel A was driven, starting some few feet lower down the steep hill side, and cutting through the ore body, which was said to be 20 feet wide at this point, but which could not be inspected, as the tunnel had caved in previous to my visit. The tunnel was then still further continued into the country rock for 15 feet, making a total length of some 35 feet in all.

About 35 feet vertically below Tunnel A, and a short distance to the left, another Tunnel, No. 1, was started with the object of proving the ore body with further depth.

This tunnel at once cut through an ore body about 20 feet thick, similar to that disclosed in A, but whether actually the same is uncertain, as the dips do not appear to agree.

After running through ore for some 20 feet this tunnel takes a slight turn to the left, and for 90 feet is in country rock; a body of good ore is here struck and is cross-cut for some 28 feet.

The tunnel then takes a sharp turn to left again, and continues in ore for 30 feet. After this, for 180 feet it runs through country rock, when ore is again struck, the tunnel continuing for 30 feet further still in ore.

At the point in the tunnel where ore was encountered the second time, a drift was set off to the right, to prove the ore body in that direction, and this continued in ore for about 40 feet, afterwards running into somewhat mineralized country rock.

Two other drifts were set off from the main tunnel, to the right and left respectively, at a point about 50 feet in from where the second ore body was dropped, that to the right disclosing a small body of ore.

Some 112 feet below No. 1 Tunnel, and somewhat to S.W., No. 2 Tunnel has been driven straight in to the mountain for 325 feet, in a N.W. direction, with three small cross-cuts.

In the length of the tunnel two bodies of low grade ore have been encountered, but do not appear to be the same as those met with in the upper workings.

At a point in No. 1 Tunnel, some 180 feet in from the mouth, connection has been made with the surface by a shaft, which I could not inspect, but which, I was informed by the management, was in ore for most of its length.

Some 190 feet above Tunnel A an inclined shaft was being sunk on an outcropping of copper pyrites, occurring on a lime-dabase contact. This shaft was closely timbered, but I was informed had been in ore most of the distance, as it was, at the time of my visit, 70 feet down.

The development performed, some 2,100 feet of underground workings, seems to prove the existence of large bodies of good grade copper ore at or near the lime-diabase or quartzite-diabase contact; but that these bodies have any connection with each other, or form part of one continuous ore body, remains to be proven by further development.

Jingo Bird and *Jingo Bird No. 2*, owned by R. W. Lindsay, Alberni, B.C., are situated on a creek flowing into the Taylor River, which, in turn, flows into Taylor Arm, Sproat Lake. The claim is reached from the lake by a trail of 3 miles, and is at an altitude of 2,500 feet.

A banded quartz vein, 11 feet wide, with well-defined walls of diabase, is exposed in the creek. Work on the property has been confined to stripping the surface, and shows the vein cutting the creek bed diagonally, and having a strike south west and a dip of 60° to south-east. There is a distinct gouge matter on either wall, and the quartz is well mineralized with pyrites and a little galena.

This, the first claim located hereabouts, was discovered only last summer. Most of the work done this year has been the building of a trail to the mine, and this has been performed at the locator's expense.

In its present undeveloped stage, it is impossible to say much about the vein, as it immediately disappears under the soil on either side of the creek. There is ample timber on the claim, but not much water power available.

This property is situated at the head of Granite Creek, a branch of **W.W.W. Group**. Hiwatches Creek, at an elevation of 1,900 feet. The group consists of *W.W.W. Nos. 1, 2, 3, and 4* mineral claims, all surveyed, and for which applications for Crown grants have been made.

The trail leading to the group starts from Alberni Canal, at a point a little to the south of the mouth of Hiwatches Creek, which latter it follows up to the junction of Granite Creek; it then follows Granite Creek to its head, a total distance of some 12 miles over a very inferior trail.

All the development work has been done on the *No. 1* claim, where, on the hillside, a white quartz vein, some 16 inches wide and with well-defined walls, shows on the surface. It has a strike S. 30° W. and dips to the east at an angle of 42° . This quartz vein exhibits a banded structure, and is mineralized with iron pyrites, some galena and zinc blende, and a small quantity of copper pyrites. It carries gold values probably associated with the iron pyrites.

Immediately below this surface showing, a tunnel was started, cross-cutting for a short distance until it struck the vein, then following the course of the vein for a distance of 94 feet. From this tunnel, at a point some 54 feet in from the mouth, an incline was being sunk on the vein, and was down from the tunnel some 57 feet at the time of my visit.

The vein, as exposed, seemed to have its greatest strength from the mouth of the tunnel inwards to about where the incline was sunk, and would appear here to have been about 16 inches wide, well defined and with good walls. From this point into the "face," the vein pinched somewhat, and finally split up into a number of barren-looking quartz stringers, which were "frozen" to the country rock. The vein, for the greater length of the tunnel, had been stoped out in the roof for some height up.

At the head of the incline, the vein was about 16 inches wide, free and well defined, with a considerable mineralization, but, in following it down, it gradually diminished in width and the amount of mineral present decreased (although it still remained free and well defined); indeed, at the bottom of the incline, it only showed some 6 inches of white quartz with slight mineralization.

At the time of my visit, some 10 men were employed sinking the incline and stoping out the best ore above the tunnel. The ore was being hand-sorted, sacked, and packed by horses to the Alberni Canal, from whence it was to be taken by steamer to the Tacoma smelter.

Certain picked samples from the surface, showing free gold, assayed as high as \$3,000 per ton, while, in the tunnel, the best ore gave \$32 in gold, 2.6 oz. silver, and no copper.

This property is situated two miles from the head of Snug Basin, Belvidere Group. Howchuckslat Harbour, from which it is reached by trail. The group consists of the *Orphan Boy*, *Fisher Maid*, *Belvidere*, *Santa Cruz*, *Ocean Wave*, *Big Bear*, *Alpha*, and *Torilla*, and is owned J. Stark *et al.*, of Nanaimo.

The first showing met with is an outcrop of magnetite carrying a little copper pyrites, but the little surface stripping that has been done does not show the ore body to have any definite extent.

About 350 feet above the first outcrop, and at an altitude of 650 feet above Snug Basin, a shaft 20 feet deep had been sunk on an open fissure, which existed at a contact between a rather massive magnetite, carrying copper pyrites, on the one side, and a highly crystalline limestone on the other. There was also present in the magnetite a fine-grained, crystalline, green, igneous rock (epidote). The ore on the dump showed some good copper pyrites, but the shaft is in loose ground, and there was no evidence of any defined body of ore.

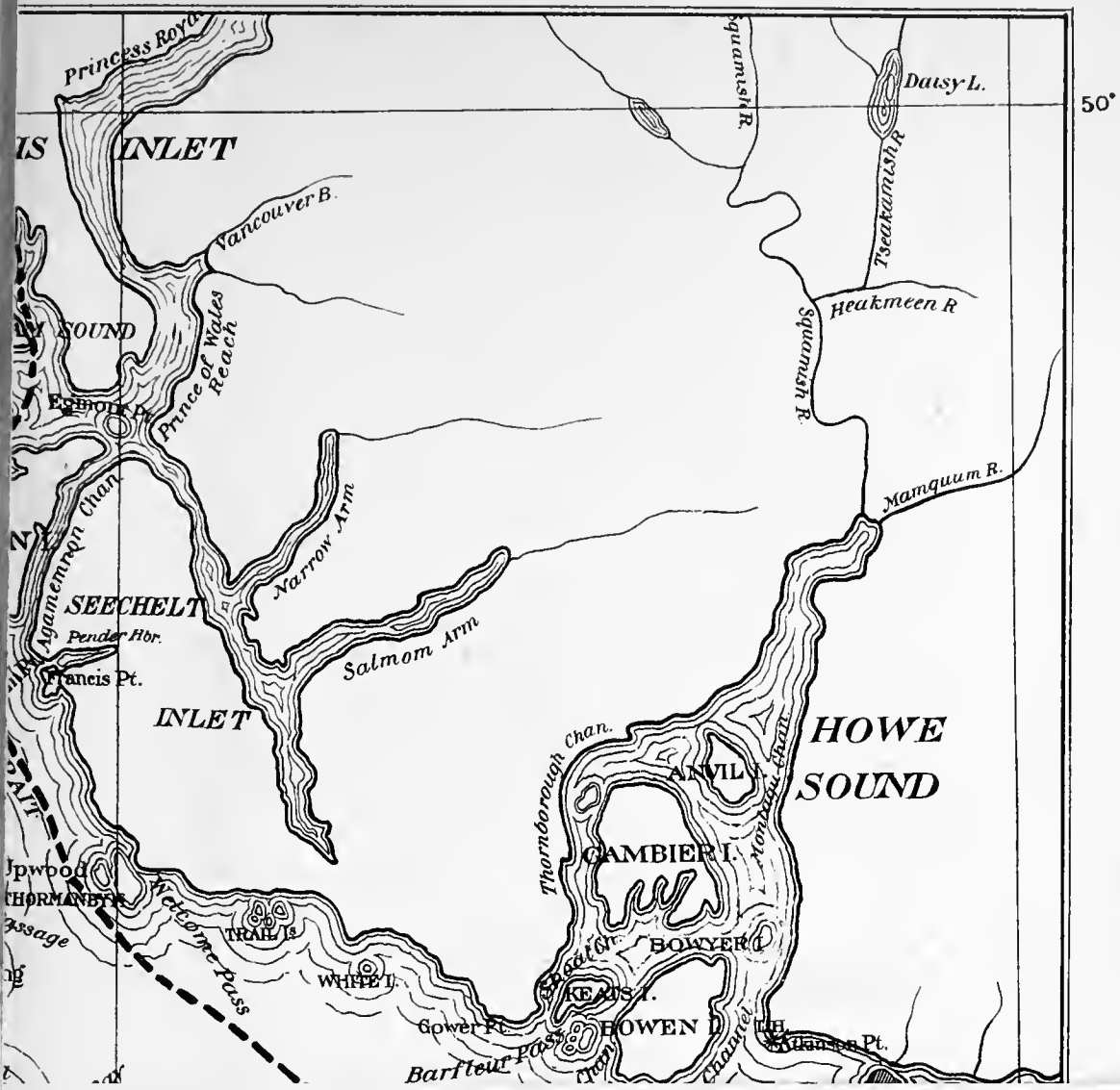
At a distance of 250 feet in a northerly direction, and at the same level as the last-mentioned outcrop, a cross-cut had been run in diagonally on a well-defined vein about 12 feet wide, having a strike N. 30° E., and dip 65° N. and W. A shaft 18 feet deep had been sunk close beside the cross-cut on the vein, cutting through the foot-wall about 3 feet from the bottom. There is a very distinct band of soft gouge along the foot-wall. The vein-matter is calcareous and heavily mineralized with iron and copper pyrites. The foot-wall is a fine greenish rock (pyroxine), mineralized with iron pyrites, and further out gradually becomes a trap.

About 100 feet further, in a northerly direction and in the same course as the vein, a little surface stripping has been done, which shows ore similar to that just mentioned, and is presumably the same vein.

About 100 feet still further away, in an easterly direction, there is an outcrop of a more or less decomposed magnetite, carrying a little copper pyrites, but the work done did not afford sufficient data on which to base any conclusion as to strike, dip, or extent of the ore.

Consisting of *Blue Bell Nos. 1, 2, 3 and 4*, *Ironclad Nos. 1, 2, 3 and 4*, **Blue Bell Group.** and *Jackson* claims, owned by A. Shafer *et al.*, Alberni, B. C. The first outcrop is on the *Jackson* claim, at an altitude of 450 feet. Here an open cut of 14 feet has been made, which shows some 3 feet of solid ore, consisting of pyrite, pyrrhotite, and copper pyrites, on a contact of lime and trap (with epidotic rock and a little hornblende). The ore body is wedge-shaped, with the thin end downward, and is cut out by the epidotic rock and hornblende. The outcrop is clearly marked on the surface and traceable for a considerable distance, having a strike S. 30° E., and a vertical dip.

About 250 feet in a north-easterly direction, and 40 feet higher up, there is a second small outcrop of ore, on what appears to be a similar contact, but, as the ground is much disturbed at this point, it is at present impossible to say that there is any body of the ore. At an elevation of 2,000 feet, on the *Ironclad*, there is a large and massive outcrop of pyrrhotite, carrying a little copper. No work has been done on it, however. On the *Blue Bell* there is an open cut, 15 feet long by 15 feet deep, in solid ore, principally pyrrhotite.





**SKETCH MAP SHOWING
Southern End of Vancouver Island**

REFERENCE LIST OF MINERAL CLAIMS.

No.	Min. Div.	NAME OF CLAIM.	OWNER.	No.	Min. Div.	NAME OF CLAIM.	OWNER.
1	Nanaimo	Marble Bay	Falmer & Christie	1	W. Coast V.I.	Smith & Radford	Smith & Radford
2	"	Van Anda	Van Anda Cop'r & Gold Co.	2	"	Rose Marie	B. Bonthron et al
3	"	Surprise	Treasury Mines, Ltd.	3	"	Kloeber	Dr. Kloeber
4	"	Iron Mine	Puget Sound Iron Co.	4	"	101	Earle & Magnesen
5	"	Black Prince	McConville & Galbraith	5	"	North Cap	"
6	"	Cameron Lake	Kitchin et al	6	"	Tofino	Westcoaster Mines
7	"	Robins	Samuel Robins	7	"	Latchbrook	Hayward, Holland et al
8	Victoria	Lenora	Smith et al	8	"	Sunrise	Goings & Young
9	"	Tyce	Livingstone, Dickie et al	9	"	Michigan	Peterson & Irving
10	"	Lubbock-Phair	Lubbock, Phair	10	"	Crow	Peterson, Drinkwater et al
11	"	Ralph	Wm. Ralph	11	"	Jumbo	Rickarde, Campbell
12	"	Success	Young Bros. et al	12	"	Hetty Green	Thompson & Ward
13	"	Black Prince	Wm. Lorimer et al	13	"	American Wonder	J. M. Ashton
14	"	Braden	Wm. Braden et al	14	"	Patience	Westcoaster Mines
15	"	Newton	H. E. Newton	15	"	Prisco	"
16	"	Thistle	Young Bros.	16	"	Belvidere	Hovelaque
17	Alberni	Jingo Bird	W. Lindsay	17	"	Black Fox	Franks et al
18	"	Raven	Keeney	18	"	Corona	Hovelaque
19	"	Pansy Blossom	Law et al	19	"	Satanita	Morris, Cooper et al
20	"	Alberni	Consolidated Alberni	20	"	Valentine	"
21	"	Regina	Hovelaque et al	21	"	King Richard	P. Jacobsen
22	"	King Solomon	McQuillan et al	22	"	New York	British Pac. Gold Prop'y
23	"	Golden Eagle	H. E. Newton et al	23	"	Castle	Talbot et al
24	"	Star of the West	Saunders et al	24	"	Iron Cap	P. Jacobsen
25	"	Starlight	"	25	"	Jones & Stockham	Jones & Stockham
26	"	Thistle	Watson et al	26	"	Good Hope	Helga Mining Co.
27	"	Happy Tom	"	27	"	White Pine Cove	"
28	"	Eclipse	Saunders et al	28	"	Dewey	"
29	"	W. W. W.	English-Can. Syndicate	29	"	Moir	Jas. Moir et al
30	"	Eureka	"	30	"	Indian Chief	Dewdney's Can. Synd'te
31	"	Sarita	Wilson, Irving et al	31	"	Black Bird	Dr. Marshall
32	"	Copper Island	Wilson, Irving et al	32	"	Thelma	Jacobsen et al
33	"	Lord of the Isle	Anderson, Ladd				
34	"	Sullivan	"				
35	"	Hayes	Nahmint Mining Co.				
36	"	Visigoth	W. B. Garrard				
37	"	Blue Bell	Carlioh et al				
38	"	Lakeshore	Williams et al				
39	"	Stark	J. E. Stark				
40	"	Iron Mask	W. B. Garrard				
41	"	Mountain Treasure	"				
42	"	Great Expectation	Hall, Boggs et al				



The *Lake Shore Group* consists of four claims, the *Lake Shore, Lake Shore No. 1, No. 2,* and *Extension*, owned by A. Shafer *et al.*, and under bond to B. Williams, of Victoria.

On the eastern shore of Anderson Lake, about a mile and a quarter from its outlet, there are, at the water's edge, several outcroppings of ore, consisting of magnetite, pyrrhotite, and chalcopyrite.

About 25 feet above the lake level, a 5-foot open cut and a 10-foot tunnel have been run into the hillside on an outcrop of solid ore of the same character, which would appear from the surface work to exist along a contact between lime and diabase. These workings are in solid ore, having a total width of about 10 feet. A drive, 18 feet long, starting from the tunnel, has been run to the north-east, and appears to have followed a wall of green igneous rock on the right-hand side, with a parting of gouge on the east side of the tunnel, the dip being perpendicular.

From the short tunnel, a drive, 42 feet long, was made to the south-east, cutting through the ore within 2 feet of the mouth, and showing a distinct gouge parting. For the rest of the distance, the drive is in trap rock, slightly mineralized with iron pyrites. This drive was presumably run to cut an outcrop which shows up in that direction on the surface, but it failed to discover any ore.

About 20 feet to the north-east, a tunnel was started on an outcrop of ore, which appeared fairly well defined on the surface. This tunnel has been driven 70 feet in an easterly direction, but, except at the mouth, shows no ore, being in a trap rock all the way. At the entrance of this tunnel there is a peculiar arch of hornblendic rock, enclosing lime and solid ore. Outside this there is green epidotic rock, and, further out, diabase.

There is a good showing of ore on the dump of the first tunnel, but I believe values are small. The compass is useless on this claim, owing to the strong local attraction of the magnetite and pyrrhotite.

The ore seems nearly always to lie along the contact of the lime and trap, and to be associated with epidotic or hornblendic rock.

There is ample timber on the property, but no water power.

Great Expectation. Upon this claim, owned in Victoria, a tunnel has been started on a well-defined quartz vein sparsely mineralized with copper pyrites and bornite, both walls of which are a diabasic rock. At 42 feet within the tunnel, as it runs in on the vein, the quartz shows up 18 inches wide with well-defined walls. At this point the quartz takes a turn towards the hanging wall and the tunnel does not follow it but continues in the original direction and for a few feet is in country rock. Another quartz vein then comes in on the foot-wall widening out to 4 feet, and at the tunnel face, 114 feet from the mouth, showing a width of 3 feet 6 inches with the right side of the tunnel still in quartz; the hanging wall is a diabasic rock. The strike (N. 75° E.) of both veins seems to be a point or two more easterly than the general direction of the tunnel.

This mineral claim is owned by a Seattle syndicate, represented by Mr. Lord of the Isles. Anderson, of Sechart. It is situated some two miles from the wharf in Sechart Channel, Barclay Sound, at an elevation of 850 feet above the sea. On the claim there is a fair showing of magnetic iron ore of good quality, occurring, apparently, at or near a contact of highly crystalline limestone with an igneous rock, probably diabase. The geological conditions are somewhat complicated and the amount of development done is small, entirely insufficient to base any theory upon as to the probable extent or mode of occurrence of the body of ore.

The amount of ore so far shown up is unimportant. The following is a brief description of the work done.

A tunnel was started in from the side-hill, running nearly north, on a contact of a body of solid magnetite on the right hand side and of diabase on the left, following such contact in for some 20 feet, after which a highly crystalline limestone came in on the left, replacing the diabase. At 24 feet in this lime-magnetite contact took a right-angled turn to the right or east, the tunnel following it for 30 feet and having magnetite, for the greater part of the way, on the right (south) wall and crystalline lime on the other wall until, near the "face," the magnetite was cut out, presumably by a diabase dyke, and was not seen again. At the inner or eastern end of this tunnel a winze had been sunk 16 feet, but was full of water at the time of my visit. From about the middle of the east and west part of the tunnel a drift had been run to the north (*i. e.*, parallel with the first part of the tunnel) for some 40 feet in crystalline limestone, but at the "face" had cut into a diabase again. No ore shows anywhere in this drift.

ALBERNI MINING DIVISION.

REPORT BY THOS. FLETCHER, GOLD COMMISSIONER.

McCONNELL'S CAMP.

The *Uncle Sam Group* is situated on the Alberni Canal, 18 miles from *Uncle Sam Group*. the Town of Alberni, and consists of the *Nahwitka, Uncle Sam and John Bull* mineral claims. All the work for the group has been done on the *Uncle Sam* and consists of a tunnel run 40 feet along the vein, being in ore all the way. There is a pile of ore on the dump estimated at over 300 tons, and assaying about 20 % copper.

Situated on Anderson Lake, consists of the *Lake Shore, Lake Shore Lake Shore Group No. 1 and No. 2*. Three ore bodies are supposed to occur on the property.

On the first of these an adit has been driven 74 feet with a cross-cut at the face of 32 feet, in which is exposed a lead, 13 feet wide, of quartz carrying chalcopyrite.

On the second ore body, which appears to be chiefly pyrrhotite, a tunnel 30 feet and a cross-cut of 19 feet have been run. The third ore body, represented by an out-cropping, has not been cut at a depth, but a tunnel has been run 45 feet, and it is expected that in 25 feet more the ore body will be reached at 60 feet below the out-crop.

These claims are situated on Copper Island, in Barclay Sound. The *Copper Island Mineral Claims* ground slopes from the water's edge to a height of 900 feet. At the base of the incline out-crops of white iron with a little copper were found, but no ore body of value was shown up. Higher up the hill surface work has exposed out-croppings of magnetite of considerable size and considered by experts who have seen them to be worth working for iron, being so conveniently situated for cheap transportation. There is a surface cut, 70 feet long, through the out-croppings on the property, in the bottom of which some appreciable quantity of copper is to be seen.

Is situated about two miles up the Sarita River, on the banks of which *Sarita Mineral Claim* is an exposure of good copper ore. Starting 14 feet above water level, a tunnel was run in for some 85 feet, from a point in which, 70 feet in, a winze was sunk some 56 feet, and from the bottom of this winze a drift was run 25 feet. In the tunnel and upper portion of the winze there was exposed a large amount of

white iron with a little copper, while in the lower part of the winze and in the drift the white iron had largely disappeared from the vein-matter which contained bands of yellow copper ore.

The Nahmint Mining Company's property is situated on the north-west side of the Alberni Canal. This is by far the best developed property in the District, having over 1,000 feet of underground workings and employing an average of eight men underground and four above. It is under the management of Col. G. H. Hayes.

A very considerable body of good chalcopyrite ore is exposed and several shipments have been made this past year which, from smelter returns, ran about 10 to 12 % copper with small values in gold and silver.

The *Three W.'s Group*, as it is called, is situated near the head of Granite Creek, and consists of the *W. W. W. No. 1, No. 2., No. 3. and No. 4.*

A considerable amount of work has been done on the *W. W. W. No. 1*, some 6 men being employed and several shipments of ore made. The first three of these claims have been Crown-granted.

The *Eclipse Group* consists of *Eclipse No. 1, No. 2 and No. 3* mineral claims, situated on Granite Creek. On *Eclipse No. 2* a tunnel has been driven some 18 feet.

Is situated about 11 miles up Granite Creek, near the base of Mount Logan. The work done on the property consists of 40 feet of tunnel and some 12 feet of shaft. The lead is from 1 to 3 feet in width, carrying good gold values.

Golden Rule Nos. 1 and 2 are promising properties, having a 2-foot lead carrying galena, and are owned by H. S. Law *et al.*

Union Jack Group is situated on the Alberni Canal, opposite Hayes' Landing. On the *Surprise*, one of the group, is a 3-foot lead carrying good copper values. Owners, H. S. Law, *et al.*

These claims are situated at the head of China Creek, and owned by Golden Eagle and H. E. Newton & Co., of Victoria. The property has been worked the entire year. The Company is at present engaged in driving a cross-cut tunnel from the *Okolona* to tap the ore body exposed in the upper workings of the *Golden Eagle*, at a point some 500 feet lower than these workings, which consist of some four tunnels, varying in length from 50 to 100 feet, and developing a quartz lead of some 8 feet in width, carrying gold values. It is estimated that this lower tunnel will have to be run a total distance of 700 feet before the ore body can be expected to be reached, and of this distance some 600 feet has already been driven.

Jingo Bird No. 1 and No. 2. These properties are situated about three miles from the head of Sproat Lake. On the claims there is a wide quartz ledge, having a distinct gouge on either side, and carrying a percentage of iron sulphides and some galena and zinc blende, with values in gold and silver.

Double Crown No. 1 and No. 2 mineral claims, situated in the same district, have exposed on them a lead 4 to 6 feet wide, traceable for 500 feet, probably a continuation of the *Jingo Bird* lead, and having the same class of ore as is there found.

Monte Group is situated at the head of Sproat Lake, and shows two large leads, varying from 25 to 100 feet wide, and highly mineralized with iron sulphides. The assays, however, have been low, only showing a maximum of \$7 in gold, silver and copper.

OFFICE STATISTICS—ALBERNI DIVISION.

Free miners' certificates issued	125
Mineral claims recorded	195
Placer leases granted	5
Water rights granted	1
Certificates of work recorded	244
Certificates of improvement	16
Conveyances, bonds, &c., recorded	100

WEST COAST, V. I., MINING DIVISION.

REPORT BY H. CARMICHAEL, PROVINCIAL ASSAYER.

The Mining Recording Office of this Division is situated at Stockham & Dawley's Landing, Clayoquot. It cannot be said that there is a village at Clayoquot, since there is nothing more than Stockham & Dawley's wharf and trading store, situated on one small island in Clayoquot Sound, and, a mile and a half away, situated on another small island, Jacobsen's wharf and store. Very comfortable accommodation can be had, however, at hotels run in conjunction with these stores.

On the Clayoquot Indian Reserve there is an extensive village, from the Indians of which boats, with men to handle them, can always be had.

What is known as the Clayoquot district is an area of about 16 miles north and south by 30 miles east and west, comprising Clayoquot Sound, with all its inlets and the drainage areas thereof. These inlets are numerous and long, and the tide, which has a rise and fall of about 12 feet, causes strong, swift currents to run through them, which, if known and understood, can be taken advantage of in such a manner as to greatly facilitate navigation.

WRECK BAY, UCLUELET.

Black Sand. Wreck Bay is a semi-circular indentation on the west coast of Vancouver Island, extending about 3 miles along the coast and 1 mile inland, and is situated about 5 miles north of Amphitrite Point. It is exposed to the full force of the Pacific Ocean, but may be reached overland from the head of Ucluelet Arm by a trail $2\frac{1}{2}$ miles long, at present much overgrown with sallal bush, which seriously interferes with travelling, as it does with prospecting, in most places on the West Coast.

The beach bordering on the bay is exposed only at low tide, an ordinary high tide washing the base of the gravel banks which form the coast line, and rise abruptly above the water to a height of 76 feet. All along this beach is to be found a fine black sand (magnetite), with which is associated fine gold. This sand is usually so much mixed with the ordinary beach sand and pebbles that it might easily be overlooked, since the quantity is so slight as to only attract attention when it happens to have been somewhat concentrated by the beach currents.

Some five adjoining claims have been taken up as hydraulic leases, each having 500 yards on the beach front extending down to low water mark. From the lessees of these claims it is learned that the value of the sand varies from nothing a ton upwards, according as the water has concentrated the black sand, the average value of the beach being only a few cents per ton; and this, they consider, will enable them to work at a profit, with suitable mechanical means for the cheap handling of the material.

This group consists of the *Rose Marie Nos. 1, 2, 3, 4, and 5*, and is owned by the Rose Marie Mines, Limited; head office, Vancouver; Barclay Bonthrone, manager. The property is situated on the eastern slope of Elk River, some little distance above the point where that river flows into Kennedy Lake, which, in turn, empties itself by Kennedy River into Tofino Inlet on the south-east side.

Deep-draught vessels can safely enter the mouth of Kennedy River, but can proceed no further, as a series of rapids, extending for some 500 yards and having a total fall of 9 feet at high water, renders it difficult, even with the highest tide, to pole a canoe up-stream against the current.

Kennedy River, from these rapids up to the lake, a distance of some 4 miles, is comparatively deep and tranquil, and is navigable for boats carrying freight, as also is Kennedy Lake for its full length of 14 miles. The width of the latter is 5 miles.

Elk River, which flows into the arm at the head of Kennedy Lake, is navigable, for canoes only, as far up as *Rose Marie Group*.

The mountain, upon the side of which the property is situated, rises abruptly above the water for some thousand feet, and, about half way up this slope, there outcrops a quartz vein, of from 15 to 24 inches average width, exhibiting a banded structure, and having well-defined walls standing out clearly and distinctly against the bluff. This vein has been traced up the side of the hill and, for a distance of over 100 feet, across the more level summit. It has, in places, a width of 3 feet.

Such development as had taken place, at the time of my visit, was confined to surface stopping and open cuts, no underground work having been done.

The quartz in the lode is mineralized with iron pyrites, occurring in streaks or bands parallel with the walls of the vein. These pyrites carry very fair gold values of about \$12 to the ton of ore. It is the intention of the owners to concentrate the ore, experiments having shown that 12 tons will yield about 1 ton of concentrates. These concentrates will then be shipped, in flat boats, down the rivers and lake to Tofino Inlet, and from thence, by steamer, to a smelter.

A concentrator building had been erected on the river bank, and, at the time of my visit, the machinery was being placed in position. This consists of one 7 by 12 Dodge Crusher, two Tremain Steam Stamps (small size), and one Wilfley Table. It was also intended to put in a second Wilfley Table and a classifier.

The motive power will be supplied by a small engine, while a 50 horse-power boiler, now on the ground, and which will be followed later by a second, will provide steam for the stamps and pumps, and also for a 2-drill Rand Air Compressor.

DEER CREEK.

The *Jumbo* and *Barney* are adjoining mineral claims owned by the Jumbo & Barney Junbo Mining Syndicate; N. Campbell, agent, Clayoquot. A shaft has been sunk on these claims to a depth of 42 feet upon an irregular ore chute, which, from the surface showing, would be about 25 feet wide.

What appears to be the hanging wall has been followed down, and is fairly distinct but "frozen." The vein-matter is a lime feldspar, which is considerably mixed, in places, with the country rock, and is fairly well mineralized, in parts, with bornite and copper pyrites, the former giving place to the latter as depth is attained. At a distance of 30 feet down, a cross-cut has been started to drift to the footwall, and, although in 8 feet from the shaft, it is still penetrating the vein-matter, and has not yet reached the objective point. The gangue in this

cross-cut is more or less mineralized with fine and, occasionally, with bunches of solid copper pyrites. The ore chute is traceable on the surface for a distance of 160 feet, and has been cross-cut by a tunnel, 25 feet long, at a distance of 90 feet from the shaft.

About 125 feet to the north of the main showing there is an outcrop, from which some good grade ore has been taken. The work at this point was, however, discontinued, as the ore body was not well defined.

A flume, 180 feet long, has been built at Copper Creek giving sufficient head to work a 12 by 6 foot overshot wheel, which will be utilized to drive a fan, pump water from the workings, and to drive a hoist. This wheel was nearly completed at the time of my visit.

Consists of the *Hettie Green* and the *Rothschilds* mineral claims, and
Hettie Green Group is owned by Messrs. Ward, Thomson and others, Alberni. This group is situated on Deer Creek, about $1\frac{1}{2}$ miles from its outlet into Tofino Inlet, and at an altitude of 200 feet.

On the *Rothschilds* there is a 12-foot open cut, started on an outcropping, about 20 feet wide, of magnetite, largely mixed with calcite gangue matter and igneous country rock, and carrying a small percentage of copper pyrites. A tunnel, in which very little ore shows, has been run in from the open cut.

I did not visit the *Hettie Green*, which is farther up the same creek, as there was no one working there at the time, and I was unable to find the trail leading to it. I was afterwards shown, while at Clayoquot, some fine specimens of copper pyrites which, I was told, had been taken out of this claim while the last assessment work was being done.

This group consists of the *Crow*, *Two Sisters*, and *Lady S.* mineral
Crow Group. claims, of which the *Crow* has been surveyed. The owners are F. Jacobsen, J. Drinkwater, K. Peterson and others, all of Clayoquot.

These properties are situated on Deer Creek slope, about a mile above the outlet of that Creek into Tofino Inlet, and at an elevation of 840 feet.

The principal development work has been done on the *Two Sisters* claim, where a fine showing of iron and copper pyrites occurs on a lime-diabase contact, which has a strike of about N. 60° E., with a dip of 65° to north. On this contact an open cut of 17 feet, and a tunnel of 37 feet, have been made.

In the open cut, and for the first 20 feet of the tunnel, considerable mineralization is apparent; then limestone comes in, cutting out the ore body. Towards the face of the tunnel, however, the limestone trends off sharply to the left, and ore, which takes its place for the last three feet of the tunnel, was still in the face at the time of my visit.

The ore is iron and copper pyrites, with a little pyrrhotite, in a trap gangue. On the dump there is a lot of very fair ore, running about 8 % in copper, with 1 ounce silver, and \$2 in gold per ton.

On the adjoining claim, the *Crow*, there are several outcrops of iron and copper pyrites, the principal showing being on a small creek, and having a strike N. 70° E., with a dip of 60° to north.

This outcrop, as exposed by a considerable amount of surface stripping, is about 12 feet wide, with a foot-wall of trap and a hanging wall of limestone, neither of which are very clearly defined. The vein-matter carries a considerable amount of iron and copper pyrites in diabasic gangue.

TRANQUIL CREEK.

This creek flows into Tofino Inlet on the north side, and upon it, during the past year, a number of claims have been located.

The chief group of claims on this creek is the *American Wonder*, situated about $3\frac{1}{2}$ miles from the mouth and at an elevation of some 2,000 feet, the principal owner being Gen. Ashton, of Tacoma. A small amount of surface work has been done at various points on the group, the most important of which is a short distance above the mine cabin, where a well-defined outcropping of ore has been exposed.

Some 20 feet below this outcropping an open cut had been begun, and was in some 15 feet. From this point a tunnel had been run for 27 feet, cutting the vein from wall to wall, and exposing about 12 feet of nearly solid ore, consisting of copper pyrites, mixed with magnetite in a greenish igneous rock (epidote).

The ore chute runs diagonally into the mountain in a direction approximately N. W. and S. E., as nearly as I could judge, the compass being affected by the magnetite present. The dip is nearly vertical.

The ore body is enclosed in walls of a diabasic rock, and occurs near a contact with limestone, but I could not see that the latter formed any part of the enclosing material. The hanging wall appears to be well defined with distinct gouge matter; the foot wall is not so well defined.

So comparatively little work had been done and so near was it to the surface outcropping, that little had been proved as to the extent of the ore body, at the time of my visit, but from the workings now completed some very good copper ore has been taken.

BEAR RIVER.

Bear River flows into the head of Bedwell Sound at a point now known as Port Hughes, where, I am informed, a hotel has been built since my visit, offering suitable accommodation for travellers. Bear River is, in the dry season, a stream of moderate dimensions, while in the winter it is a mountain torrent subject to very rapid rises.

A trail, built by the prospectors with Government assistance, extends up the valley for some 8 miles, claims being located on either side for most of the way.

In the early 60's Bear River had a placer gold excitement, and about 12 years ago some 15 Chinamen were at work on the upper reaches of the river, washing for gold; these, however, suddenly left in a body, having been driven away, it is said, by superstitious fears engendered by the sudden death of one of their number. The workings of these early miners are still visible and it is reported that they found considerable gold, but that the numerous large boulders prevented the work being profitable. There is little doubt but that the gold found in these placer diggings had its origin in the erosion of the numerous small quartz veins everywhere visible throughout the country rocks.

This group consists of the *Seattle, New York, Omaha, Tacoma* and *Seattle Group*. *Rebecca Fraction* mineral claims, and is bonded to the British Pacific Gold Property Co., of Victoria.

From Port Hughes, following the main trail up the valley for two miles, thence striking off up the mountain to the left, the *Seattle Group* is reached at an elevation of 700 feet. To the right of the mine building there is an outcrop of magnetite with some mixed iron and copper pyrites. The general course of this ore body, up and down the mountain, is N. 15° E.; the width is not very well defined. At the lower end of this outcrop a shaft had been sunk some 30 feet. The width of the ore body at the surface was about 8 feet, but as exposed in the shaft, this width gradually diminished as depth was attained until, 20 feet down, the vein

pinched out. For the remaining 10 feet the shaft followed a slip wall in diabase, no ore showing, however.

On the dump there is some very good ore taken from the upper 20 feet of the shaft, and carrying fair copper values. The silver and gold values are unimportant.

Some short distance down the hill a tunnel was being so driven as to run under the shaft already mentioned and, continuing further, to pass under a second and larger outcrop showing on the surface. At the time of my visit, this tunnel was in 100 feet and it was calculated that it would have to go 72 feet further before being under the shaft.

This group is reached by the same trail as is the *Seattle*, being situated
Castle Group. further up the mountain at an altitude of 1,200 feet. The group consists of four claims, the *Castle*, *Golden Crown*, *White Swan*, and *Blue Jay*, and has been bonded by Mr. Geo. R. Talbot. Title, location.

The principal work has been done on the *Castle* claim, where a shaft has been sunk to a depth of 45 feet on an ore body having a strike N.N.E. and a dip 70° W. At the surface, this ore body has an approximate width of 10 feet, and appears to widen towards the bottom of the shaft, but the walls are not well defined. The ore consists of magnetite, pyrite, and copper pyrites, in a calcareous and diabasic gangue, the walls being a mixture of diabase and diorite, locally called "syenite."

Work on the shaft had been stopped at the time of my visit, and a tunnel was being run, at a lower level on the hillside, with the object of tapping the ore body under the shaft. At the time, this tunnel was in a distance of 55 feet, and had still 65 feet to run.

On the same claim, a small quartz vein, carrying copper and iron pyrites with galena, has been exposed by an open cut. It has a width of 6 inches, and a strike north-west, dipping into the hill. High assays in gold are reported to have been obtained from this vein. On the *Golden Crown* there is an 18-inch quartz vein, from which good assays are reported, but on which no work has been done.

The property was being worked by a foreman (Thos. Moran) and 8 men.

Below the *Seattle*, and a little farther up the main trail, is the *Galena*
Galena Group. Group, consisting of the *Galena*, *Copper*, *Blue Top*, *Delmonico*, and *Tribby* claims, and situated at an altitude of 550 feet. The owners are J. A. Drinkwater and Geo. Brown, of Clayoquot. Title, location.

On this group, a tunnel, 18 feet long, has been driven on a slip wall with gouge parting, and on this parting or footwall a shaft, 9 feet deep, has been sunk, the wall continuing to show up strongly and truly. The strike of the vein is N. 15° E., dip 70° W., the vein-matter disclosed being a more or less mineralized diabase, which, towards the hanging wall, is replaced by magnetite, with one foot or more of solid copper pyrites, said to run 25 % copper and \$16 in gold per ton. Towards the west or hanging wall, the shaft was still in mixed magnetite and copper pyrites.

Outcrops of magnetite, carrying a little copper pyrites, have been traced for some distance in a direct line with the above-mentioned ore body. The country rock is diabasic.

This location is situated some 8 miles up the main Bear River trail,
Corona at an altitude of 1,000 feet, and is owned by P. A. Hovelaque and others.
Mineral Claim. Two open cuts, one 10 feet long, have exposed a well-defined quartz vein with good walls, having a width of from 6 inches to 3 feet. The wall rock is diabase, and the ore is iron pyrites and a little galena with free gold. Assays, running from \$18 to \$200 in gold per ton, are reported from this vein.



ANDERSON LAKE—ALBERNI M. D.



NATURAL ARCH OF HORNBLLENDE—LAKESHORE GROUP, ALBERNI, M. D.



This group consists of *Belvidere No. 1*, *Belvidere No. 2*, *Monarch*, and *Belvidere Group*. *Golden Hope* mineral claims, and is situated at the head of Bear River, at an altitude of 2,500 feet. A quartz vein, 12 feet wide, is traceable for a distance of 600 feet, and carries copper pyrites and free gold.

I am indebted to Mr. Hovelaque for my information regarding this property, which was covered by a snowslide at the time of my visit.

TROUT RIVER.

Trout River flows into Cyprus Bay, on Bedwell Sound, one of the arms of Clayoquot Sound.

This group consists of the *Good Hope*, *Good Hope Fraction*, *Hunter*, *Lea*, *Nelly*, and *Flora* mineral claims, situated on Trout River, at a short distance from the sea beach. It is owned by the Helga Gold and Copper Mining Co., of Seattle; agent, F. Jacobsen, of Clayoquot.

At a point about 550 feet from the beach, at an elevation of 245 feet, there has been exposed, by a series of open cuts, a vein some 3 or 4 feet wide, with strike N. 80° W., dip 37° S. W., and with poorly-defined and "frozen" walls. On this vein, No. 1 Incline has been sunk for some 60 feet. The vein-matter consists of quartz, mixed with diabasic rock, and the ore is a mixture of copper pyrites and pyrrhotite scattered through the quartzose gangue. The vein is said to widen to 5 feet at the bottom of the shaft, but this I was unable to verify, owing to the presence therein of from 10 to 15 feet of water.

A short distance to the east of this No. 1 Incline, a shaft has been sunk 25 feet on another quartz vein, which has a strike N. 75° W., with a dip 75° southerly, showing the vein to be from 2 to 3 feet wide. The ore is copper pyrites scattered through a quartzose gangue, and the value of that taken out is said to be—copper, 6%; silver, 2 oz.; and gold, \$6 per ton

SIDNEY INLET.

This group, consisting of the *Tinnecanem*, *Scotlett*, *Victor*, *Brutus* and *Indian Chief* *Leschi* mineral claims, is situated on Peacock Mountain, on the west side of Sidney Inlet. The owners are J. W. Jones and J. C. Kincaid, of Clayoquot, and the title is by location.

On the *Scotlett* claim, at a point 600 feet above the water, the ascent from which is fairly steep, an open cut discloses 5 feet of copper pyrites, finely and evenly disseminated through diabasic rock. Besides copper pyrites, there is some pyrrhotite and a little magnetite. The strike of the ore-bearing body is approximately east and west, with a dip of 40° to the north, but, from the small amount of work done at the time of my visit, it was impossible to form any conclusion as to its size or continuance.

Farther up the trail, at an altitude of 1,000 feet, the mine buildings are reached. A short distance above these buildings, on the *Scotlett* claim, a tunnel has been begun, under a mall stringer of copper pyrites and magnetite, much broken. At a few feet in, the tunnel cross-cuts this small vein, and then continues for 265 feet through country rock, more or less impregnated with iron.

On the *Tinnecanem* claim, at an altitude of 1,500 feet, there is a strong outcrop of bornite in a calcite gangue, with a trend N. 40° W. The wall to the east appears to be limestone, but as no work has been done, neither it nor the width of the ore body is well defined. This outcrop is traceable for a distance of 250 feet along the hillside, into which it finally disappears. Lower down, the vein carries more copper pyrites, and has an approximate width of 3 feet.

On the summit of the ridge, at an altitude of 1,700 feet, on a contact of limestone with an igneous rock, there is a small outcropping of copper pyrites and bornite, but on which no work has been done. Further along the ridge, to the west, there are two other outcrops of copper pyrites, the nearer carrying magnetite.

WEST COAST, V. I., MINING DIVISION.

REPORT BY W. T. DAWLEY, MINING RECORDER.

SIR,—I have the honour to submit herewith my annual report on and statistics of the West Coast, V. I., Mining Division for the year ending 31st December, 1899.

Considerable development has been done in this Division during the year, as many as 274 certificates of work having been issued. Several groups of mineral claims have been worked continuously, or nearly so, during the whole year. Among these are the *Rose Marie Group*, situated on Elk River; the *New York* and *Castle Groups*, on Bear River; the *Jumbo Group*, on Deer Creek; and the *American Wonder* and *Iron Duke Groups*, on Tranquil Creek.

This group, situated on Elk River, consists of eight claims, the *Rose Marie No. 1, No. 2, No. 3, No. 4, No. 5, No. 6, No. 7, and No. 8*, and is owned by the *Rose Marie Mines Co., Ltd.*, with head office at Vancouver. A force of 10 or 12 men has been continuously at work on this property since May, 1898. A large concentrating plant has just been erected, the first shipment of concentrates being made about the end of December, and regular shipments are to follow. Considerable difficulty was experienced in transporting the machinery to the mine, owing to the strong rapids in Kennedy River.

This group, situated on Bear River, is bonded to the *British Pacific New York or Seattle Group* Gold Property Co., Lim. Lia., of Victoria, and consists of the *New York, Seattle, Tacoma, Grey Mule, Brooklyn, Omaha* and *Rebecca* mineral claims. Work has been kept going continually during the year, some seven or eight men being employed. Little ore has been shipped, but a very considerable amount is on the dump ready for shipment. The work on this group has been mostly done on the *Seattle*, and consists of tunnels and shafts. The ore is yellow copper, with iron sulphides.

Is situated on Bear River, and consists of the *Castle, Golden Crown, Castle Group White Swan* and *Blue Jay Fraction* mineral claims. It is bonded to G. R. Talbot, of Clayoquot. Some seven or eight men have been employed during the year, on development work. No shipments of ore have been made from this group up to the present. Hundreds of feet of tunnelling have been driven on the property, with satisfactory results.

Gold-bearing quartz and copper ore are found in this vicinity, some fine samples of free gold-bearing quartz having been taken out of the *Corona Group*, owned by Messrs. Waterhouse, Hovelaque & Donahue.

Placer mining on Bear River is not as productive of good results as it was at one time.

These claims, situated on Deer Creek, are owned by Sir Thomas *Jumbo and Barney* Dancer and others. The property was being worked the greater part of the year, about 12 men being employed, and I hear that operations will be resumed early in the spring. The ore is bornite and copper pyrites.

On Deer Creek. This group of seven claims, owned by M. A. Ward and J. Thomson, of Alberni, has had the annual assessment work done thereon, and reports, after the last work in September, were very encouraging.

Several other claims in this locality, carrying copper ore, look very promising.

TRANQUIL CREEK.

American Wonder, Iron Duke and Superb Groups are situated on Tranquil Creek. These three groups of 18 claims are owned by James M. Ashton and Mrs Ashton, of Tacoma, Wash. A large amount of money has been expended on the properties, work being carried on for the best part of the year. When work is again resumed, in the spring, regular shipments of ore are expected to be made to the smelter. The ore is yellow copper. The claims have been surveyed for aerial tramways, etc. Certificates of improvement have been issued on seven of these claims, and will shortly be issued on the remainder of the group.

HESQUOIT.

During the year, certificates of work have been issued on most of the claims in this District, considerable work having been done on the *Guildemai* and *Thelma Groups*, on the *Brown Jug Group*, and others.

The following is a report on this group sent to me by Mr. A. Norris, **Brown Jug Group**, of Alberni:—"The *Brown Jug Group*, comprising the *Brown Jug, Brown Jug No. 2, Frankfort, Frankfort Fraction, Sapphire* and *Nimrod* mineral claims, situated on Hesquoit Lake, is owned by George A. Smith and others. The first three claims have been surveyed, and show a lead of galena and zinc blende, with some copper. This lead can be traced 1,500 feet and has been cut into at eight different points by the assessment work done, showing up strongly in each place. In one of the large cuts the ledge shows a width of 20 feet. The values received from a large number of assays give a value of from \$9 upwards per ton in gold and silver. A good cabin has been put up and a first-class trail built to the property.

This group, consisting of six claims, is situated at Sydney Inlet, and **Indian Chief Group** was bonded in the beginning of October, 1899, to the Dewdney Canadian Syndicate for a good round figure. Samples of bornite ore taken from the claims in this group were remarkably fine and gave very high assays. The Company has men at present working on the property. The last reports brought down to this office are highly encouraging.

This group, also situated at Sydney Inlet, contains eight claims, viz., **Prince Group**. *Prince No. 1, No. 2, No. 3, No. 4, No. 5, No. 6, No. 7 and No. 8*, and has just been sold to a Scotch Company. Work on this group will be actively carried on in the spring.

TROUT RIVER.

Copper ore and gold-bearing quartz of good value are found in this section. Most of the claims are looking well. The *Helga Group*, owned by the Helga Gold and Copper Mining Company, has had a large amount of work done upon it, chiefly on the *Good Hope* mineral claim. Many tons of ore are on the dump ready to be shipped.

KYUQUOT AND QUATSINO.

A considerable number of claims are recorded from these Districts and the owners are doing their assessment work. As most of the work in connection with recording property in

these sections is carried on by means of a monthly mail service, I have little opportunity of interviewing the owners and ascertaining much about their claims. This coming spring will, I fancy, find more prospectors in this part of the Mining Division.

OFFICE STATISTICS—WEST COAST, V. I., DIVISION.

Free miners' certificates issued	105
Claims recorded	153
Certificates of work recorded	274
Bills of sale, bonds, etc., "	88
Certificates of improvement "	7

WEST COAST OF VANCOUVER ISLAND.

NOTE.—The following general description of the West Coast of Vancouver Island has been kindly contributed by Mr. W. M. Brewer, a Mining Engineer who has this last year had charge of several properties in the district:—

Any article written at the present time descriptive of the geology, either from a scientific or economic standpoint, of the West Coast of Vancouver Island must necessarily be very incomplete, because so little is really known about the country for any considerable distance back from the coast line. Any attempt to make a geological map of that section of the island, even of those portions along the West Coast with which the prospector, Mining Engineer and Geologist are the most familiar, would be attended with great difficulties, because of the complications, faults, irregular lines of contact, and varied areas of the different rock formations. Consequently, in the present article the writer will only attempt to describe the geology in a very general manner, and rather with a view to showing the connection between the various formations and the bodies of mineral, which promise to be a source of considerable wealth in the future, than with a view to giving such a description as the scientist would desire.

From the fact that at several points along the West Coast, notably between San Juan Harbour and Cape Beal, the sandstones belonging to the coal measures of the Cretaceous period are found dipping to the westward under the Straits of Juan de Fuca, and are flanked by mountains formed of igneous and metamorphic rocks, it would appear as though that portion of the island itself was originally formed from these sandstones, which were subsequently tilted up by volcanic action, and have suffered degradation by erosion or denudation until only the narrow belt, which is found to-day along the West Coast, remains of the unaltered sedimentary rocks which originally constituted the rock formation northerly and westerly from the San Juan River. The term *unaltered* is used because, so far as the writer's observations are concerned, nearly all the limestones throughout the western portion of the island are metamorphosed, and usually are perfectly crystalline.

South from the San Juan River occurs a quite wide belt of semi-crystalline graphitic slates, which probably belong to the Cambrian, or possibly the Algonkian, periods. This belt is flanked by the eruptives, of which the southern extremity of the island is chiefly composed.

Of the precious metals, gold alone has been found in any quantity. It was first discovered in the channel of the Leech River as placer, and some 30 years ago it is reported that a considerable quantity was mined from both the Leech and Sooke Rivers. There is no question but that the origin of this placer gold was local. The river channels cross-cut the belt of slate and, undoubtedly, the gold was contained in the lenses of quartz which are found as intercalations

in the slates. Through erosion and decomposition the gold in these lenses of quartz became freed, and naturally was washed into the beds of the streams. Erosion has continued to such an extent that at the present time the level of the river beds are in places several hundred feet lower than the summits of the mountains on each side. There has been such an enormous quantity of material carried away through the erosion process that, at a rough calculation, some two million dollars in placer gold must have found its way into Leech River alone. Of course, as this process has been going on for long periods of time, it is not at all remarkable that only some fifty or sixty thousand dollars were won by the placer miners. (This amount is only approximate, because no reliable statistics were kept of the results of operations on these rivers.)

Since that time prospecting has been done with the hope of finding lode mines in this belt of slate, but because of the irregular structure, and the fact that those lenses of quartz which are auriferous contain such small values to the ton, no propositions at all likely to develop into mines of value have been found. At times specimens of quartz carrying free gold have been found by prospectors, and several locations staked as a result.

Northerly from this belt of slate the geology presents the complications referred to earlier in this article.

The ore bodies may be divided into three classes, viz.:—

1st. Those occurring in fissures in the igneous dykes.

2nd. Those occurring at the contact between the igneous rocks and the limestone.

3rd. Those occurring in the limestones themselves.

It would appear as though the ore bodies which occur in the dykes of igneous rocks have been deposited in narrow fissures formed during the process of cooling, and either contemporaneously with that process, or else immediately subsequent to it.

This theory is based on the fact that all the ore bodies in the igneous rocks which have come under the writer's notice are certainly formed by replacement, and extend, on the hanging wall side, for varying distances into the country rock. Only one wall occurs in any of these fissures, and the rock forming that wall, as well as that adjacent to the ore body on the hanging wall side, is so hard and tight as to contradict any theory in support of deposition of the ore at any long period subsequent to the completion of the cooling process.

The further fact, that in some instances, where a depth of even 20 or 30 feet has been attained in following the ore body down from its outcrop, it has been found that a decided pinch occurs, and that although the fissure, with one wall well defined, apparently continues to unknown depths yet that the ore has been cut off, would further support the writer's theory. So far as these particular ore bodies are concerned, or, at least, so far as the underground workings show up to the present time, there is not sufficient data to warrant the formation of any very reliable theory as to the genesis of the ore deposits or whether their origin should be accorded to the descension theory rather than the ascension, because, of course, it may be possible that such bodies being lenticular in structure, the feather edge of one wedge-shaped body has been reached in some workings; yet there may be other bodies with similar structure at still greater depths than have yet been attained in the fissures in the igneous dykes.

The second and third classes of ore bodies apparently fill cavities caused by chemical forces, such as described by Posepny, *Trans. A.I.M.E.*, vol. 23, page 208, and classified by him as "Spaces of Dissolution." Development alone will determine the extent of these ore bodies. From the surface indications, it would appear as though the theory advanced by Posepny in the following language would apply to both these classes of ore bodies:—

"Spaces of dissolution naturally occur in soluble rocks, especially limestone, and show, with wonderful clearness, the irregular course often followed by underground waters. At and

near the surface, we often find the cavity formations at the contact of soluble with insoluble rocks ; and we may infer that this relation affects also the subterranean circulation. Solution seldom extends to the whole mass of the soluble rock. Usually it affects a part only, in which it forms more or less irregular chains of cavities, sometimes so large that pieces of roof fall in, and thus spaces of discission are locally produced. A cavity filled with secondary mineral, however irregular its form may be, and even though it cuts across the stratification, usually shows a predominant course, which we are thus led to recognise as the channel of circulation of the liquid to which we owe the mineral deposit."

It is impossible, because of the limited development work which has been performed, to give in detail sufficient data to enable mining men to form any comprehensive idea of the prospects so far discovered. The writer has spent the greater portion of the season of 1899 in examining and opening up copper propositions along the West Coast. During this work, he has been impressed with the richness of many of the surface outcroppings. These he finds are principally composed of magnetic iron ore, with impregnations of chalcopyrite, or else an oxidized material which would correspond, so far as analysis goes, with the gossan usually found as the outcrop of copper deposits, but not in appearance, because such outcrops on Vancouver Island lack the porosity and decomposed appearance usually presented by the gossan. From the fact that unaltered pyrites is generally found close to the surface, it would appear as though either the zone of oxidation was quite shallow, or else that because of the extremely heavy rainfall the work of erosion was going on so rapidly that the more perfectly oxidized material had been carried away.

From the enormous outcroppings found in many locations, the inference naturally drawn by the miner would be that ore bodies of unaltered pyrites, carrying values in gold and copper, and being of considerable extent, occurred under the outcrops, but in some instances where the surface indications have been noticeable because of their extent, sinking has demonstrated that at shallow depths the ore has pinched out entirely. Of course, there are cases where this pinching has not occurred, and, in these, ore as unaltered pyrites has been found at depth.

Stringers and veins of auriferous quartz are not at all uncommon in the igneous rocks. These vary in thickness from an inch or two up to three or four feet, but generally average an insufficient thickness to warrant the carrying on of mining operations.

Alberni is the oldest lode-mining camp on the West Coast. There both the sulphide and auriferous quartz ore bodies have been developed, and considerable work has been performed, especially on the property of the Nahmint Mining Company, situated about 14 miles down the canal from the old townsite, where some 2,200 feet of underground work has been done ; on the *Lake Shore Group* of mineral claims on Anderson Lake, where 200 feet of drifting and cross-cutting has been done ; on the *Consolidated Alberni Group* on Mineral Hill, where about 400 feet of underground work has been done ; on the *W. W. W.*, on Granite Creek ; on the *Hanson Group*, about 6 miles down the canal from the Nahmint Company's properties ; on the *Sarita Group*, near Numuckamous Harbour ; on Copper Island, near the entrance to the Alberni Canal ; and near Sechart Landing, in Barclay Sound. In addition to this, assessment work has been performed on several hundred locations in the vicinity of the Canal and in other portions of what may be considered the Alberni Mining Camp proper.

The strongest and best-defined quartz veins which have come under the writer's notice along the West Coast, occur in the neighbourhood of Kyuquot. Some of these are 6 to 8 feet in thickness, and specimens have shown good values by assay. Sufficient work has not been done, though, on any of them, to warrant an opinion as to their value. Average samples taken from these veins yielded very low values, and while there may yet be discovered pay streaks

in them in the form of chimneys, unless such is done they can hardly be classed as even promising prospects. These veins are very persistent and maintain continuity along the lines of strike, in some instances across several claims. The country rock which forms the walls is so hard that in nearly every case small creeks have cut their channels along the vein itself, the quartz having yielded to degradation and decomposition more easily than the country rock.

Discoveries have recently been reported in the vicinity of Cape Cook, of a very extensive iron capping, which can be traced on the surface across several claims of 1,500 feet in length, but up to the first of January, in the present year, no work had been performed on any of the properties.

Near the north-west end of the Island, in Quatsino Sound, there has been considerable activity in prospecting for both copper and coal during the past year. The Hallidie Syndicate, of San Francisco, has expended quite a considerable amount of capital in developing coal propositions, and it is reported that coal of a good grade is being mined from a five-foot seam. If this proves to be a good coking coal, the West Coast of Vancouver Island will offer such advantageous opportunities for smelting (should the ore bodies prove of sufficient extent and grade) as can be found in but very few localities on the American Continent.

There is no doubt but that this portion of British Columbia merits close attention, and a thorough exploitation by mining men. The work that has been performed up to the present time may be considered as merely surface prospecting, except at the Nahmint Company's property on the Alberni Canal, where about 2,200 feet of underground work has been done, and a good grade of ore cross-cut on both the 250 and 350-foot levels.

NANAIMO DISTRICT.

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NANAIMO MINING DIVISION.

Nanaimo Division is primarily and chiefly a coal-producing Division, and includes within its boundaries all the Vancouver Island Collieries, the combined output of which this year (1899) was about 1,200,000 tons of coal. A description of these collieries will be found under the head of Coal Mining.

Lode or metalliferous mining did not assume any great importance until within the last two or three years, and even now, although there are a number of properties which give promise of becoming producers, the actual shipping mines are few.

Some idea of the wide-spread area in which encouraging mineral discoveries have been made may be gained from the Report of the Gold Commissioner of this District.

As yet the only two sections of the Division that have produced any appreciable amount of ore are Shoal Bay and Texada Island.

In the former section the important mine is the *Doratha Morton*, an **Doratha Morton**. extended description of which was given in last year's Report (1898). It is with regret that I have now to report that this property has closed down, with no apparent probability of operations being again resumed. The reasons for such closing down are given by Mr. J. J. Lang, the Manager of the Company, in a letter which I append, sent me in response to a request for such information.

As may be gathered from my last year's report, I then considered that the amount of successful development performed amply justified the belief of the management in the continuity of the deposit with depth.

To roughly summarize this development:—Surface work and extensive open cuts had shown a quartz lead 100 feet wide and continuous for at least two miles, while the work on the claim, which latter extends over 1,500 feet along the vein, had shown that such lead contained a clearly-defined pay streak, carrying good gold values in iron sulphides. On the strength of this a tunnel (No. 1) was driven, cross-cutting the country rock for 44 feet, when it struck the hanging wall of the vein and, continuing, cross-cut the ledge for 100 feet to the foot wall, both walls being fairly well defined.

The same paystreak shown in the surface workings was here found, and was followed by a drive to the east for 300 feet and to the west for some 220 feet, having "backs" above the drive of an average of 100 feet.

The pay streak continued the length of the drives. The lead, it is true, was broken by a fault but, as it was found again as regular as before, this only served to give confidence in its permanency. The paystreak was regularly and systematically sampled throughout the length of the drives, and the justification of the sampling is found in the yield of the ore treated; a table showing such is appended to Mr. Lang's letter.

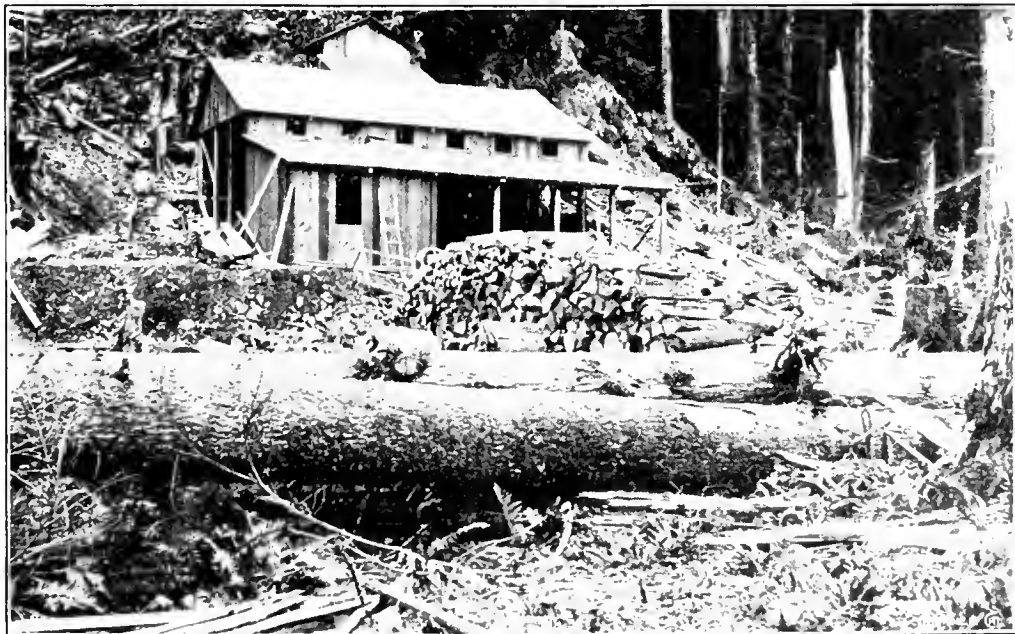
The permanency of the lead and the regularity of the paystreak thus demonstrated amply justified the driving of No. 2 Tunnel 200 feet below No. 1, and the erection of the small but complete cyanide plant on Fanny Bay.



OPEN STOPE ON ROSE MARIE VEIN—WEST COAST V. I.



ELK RIVER—WEST COAST V. I. M. D.



ROSE MARIE CONCENTRATOR.



That the ledge was struck in No. 2 Tunnel as expected will be seen from Mr. Lang's letter and also that, though it was found even wider, the paystreak had disappeared, being replaced by black shale, and that such replacement began only a few feet below the level of No. 1 Tunnel.

This all seems a singularly unfortunate example of the uncertainty of mining, for just one year ago the permanence of the deposit seemed indubitable, and everything that could be done by the expenditure of money, and by skilled and careful management, seemed to guarantee the assured success of the Company.

It is a striking proof that "ore in sight" can only be so called after it is blocked out, and is a justification of the severe criticisms made on the misuse of the term in other parts of the Province, when based solely on a surface showing and a shaft.

The following is Mr. Lang's letter and table showing the work of the cyanide plant, to which I have already referred :—

"DEAR SIR,—I am in receipt of your letter of the 8th inst., for which I thank you, and I shall be pleased to give you the reasons for the shutting down of the Doratha Morton Mine, the failure of which, I need not say, was a very serious disappointment to us.

"The facts, in a few words, are that we exhausted all the ore we could find, and, in doing so, found that the nature of the deposit was such as to preclude the possibility of its turning out a mine in the true sense of the word. We found that the pay ore was only in pockets, and not in chutes, as anticipated. In No. 1 tunnel you will perhaps remember how well defined and strong it appeared to be, and it continued so up to the surface; but you will be surprised to hear that, three feet below the level of the tunnel, the pay ore was exhausted and black shale took its place. We put in a tunnel 60 feet below No. 1, but found no ore. It proved the same in the main tunnel, 200 feet lower down. The ledge matter increased in width in the lower tunnels, but there was no value in it, the black shale taking the place of the paystreak. We worked on the outcrop, which showed well on the western end of the claim, and found this the same; 2,000 tons taken out exhausted the pocket, and the same occurred to the outcrop on the east end; so that, in three parts of the claim, we proved that the outcrops only represented small pockets. Thus, having exhausted all the ore in sight and not having found anything in the lower levels, we were compelled to shut down; but before doing so, we employed Mr. Kendall to examine the property. His report was not favourable, and from the nature of the deposit, with which he seemed familiar, he could hold out no hopes of improvement in the future, though he said that no doubt other pockets would be found to exist if development was continued; but my directors decided that it would be better to close down at once, rather than risk spending a lot of money with no hope of proving the existence of any permanent chutes of payable ore.

"I enclose a sketch of work done, which will give you a better idea of the position, and also enclose details of our crushings up to the time of our closing down.

"The disappointment at the failure of the mine was the greater as our treatment by cyanide was so satisfactory, and in every way the plant worked well.

"You may make use of any of the information in this letter that you think necessary.

"DORATHA MORTON MINE.

"Total output from December, 1898, to November, 1899.

Tons crushed.	Treated.	Cal. Extrac.	Act. Extrac.	Cyanide, per ton.	Zinc, per ton.	Bullion, ozs.
556	480	4,096.51	3,363.45	2.8	.58	641.50
647	464	6,579.44	6,232.38	2.3	.28	999.15
737	808.8	8,838.64	8,120.07	2.84	.47	1,316
796	653.9	6,200.33	7,863.96	3.1	.55	1,110
983	866.9	6,212	9,536.04	2.25	.....	1,670
1,395	1,435.1	11,731.69	13,960.86	3.08	.39	2,537
1,410	1,256.8	9,032.29	9,539.09	1.8	.33	1,937
1,041	976.6	10,896.40	9,980.01	2.9	.43	2,004
1,243	910.4	12,238.05	12,999.34	2.88	.53	2,637
1,235	1,076.9	7,178.72	7,596.22	2.1	.45	1,515
342	777.7	7,177.39	8,512.62	1.7	.39	1,477
10,385	9,707.1	92,181.46	97,704.04	27.75	4.40	17,843.65

"Loss in slimes, 6.53 %.

"Consumption of cyanide per ton treated, 2.52 lbs.

" zinc " " .44 "

"Cost of crushing, \$1.36 ; treatment, \$1.71.

"Total gold, fine, 4,434.08 oz. recovered.

" silver, " 10,222 " "

"Actual percentage gold recovered, 92.92 %.

" " silver " 71.08 %."

This section of the Division was reported upon last year (1898) by Texada Island. myself, and this summer (1899) Mr. Carmichael, the Provincial Assayer, visited the island, at my request, to note the year's progress, an account of which will be found in his report, which is hereto appended.

I have been informed, however, that, since Mr. Carmichael's visit, important development has been made in the Van Anda properties, but of this it has been impossible to make any personal investigation. I therefore availed myself of a visit to the island by Mr. Wm. M. Brewer, M.E., and requested him to make me a short report on the conditions as he found them in February, 1900.

The following is the report Mr. Brewer has kindly sent me:—

COPPER QUEEN MINE, TEXADA ISLAND.

"In accordance with your request, I am giving you, in the following report, the results of my examination of the property of the Van Anda Copper and Gold Company, made between February 8th and February 12th of the present year.

"The development on the *Copper Queen Mine* has been continued, and the vertical shaft sunk to a depth of 400 feet. On that level a station was cut, and drifting performed on the contact between limestone and the felsite dyke. As this work progressed, it was noticed that a limited quantity of ore occurred on this contact. At some little distance from the shaft in a westerly direction, an ore body was exposed, which, at the time of my visit, showed a thickness of 20 feet at the widest point. This had been drifted on for about 40 feet, with ore in

the face. No stoping had been done, but the ore body had been mined from the level of the drift and cross-cut, showing the thickness I have mentioned. The hanging wall had not been exposed.

“This ore is bornite, with a little chalcopyrite. The gangue is apparently hornblende, with actinolite crystals and garnets. The ore body appears to fill a cavity in the limestone, with felsite on the footwall side. I am of opinion that this cavity has been formed from chemical action on the soluble limestone, but whether it was formed contemporaneously with the eruptive action which brought up the felsite dyke as an intrusion, or whether subsequently, is a question yet to be solved. Apparently, a portion at least of the ore was deposited previous to the cooling of the eruptive dyke, but probably the main portion of the ore body was deposited subsequently and after the cavity in the limestone had been made.

“The development of this mine has shown that no really well-defined walls inclose the ore bodies. On the upper levels, the ore carries more limestone gangue associated with it than is the case on the 400-foot level. Very often, ore extends into the felsite for varying distances, and when this occurs it has apparently replaced a portion of the feldspar of which the felsite is composed.

“On the 200-foot level, systematic development is now being carried on, and the drifts extended along the line of strike of the contact. In carrying on this work, a narrow dyke of diorite has been cut through, showing ore on the opposite side. This would appear to demonstrate that the dykes of diorite occurring through this portion of Texada Island have been thrown up subsequently to the formation of the ore bodies. It is noticeable that no impregnations of ore occur in the diorite.

“I think it is to be regretted that previous managements neglected to thoroughly and systematically exploit the various levels in the mine. The consequence of their having performed such limited work in this respect has been detrimental to the property. At first sight it would appear that a chimney of very limited length occurred, and was continuous for considerable depth. While, of course, such an occurrence of ore would not be impossible, yet it would be exceptional, because usually there is a relationship between the length and depth of lenses of ore, and it would be only reasonable to suppose that such relationship occurred on the *Copper Queen*. As the surveys have not been carried sufficiently far, nor the actual development work performed to connect this ore body on the 400-foot level with the ore bodies opened on other levels, it would be premature to theorize on the subject.

“The work of connecting the various levels by upraises is now being performed. In fact, under the superintendence of Mr. Kiddie, a more systematic method of carrying on the work, both in the *Copper Queen* and *Cornell* mines, has been adopted, and, as this progresses, the value of the properties will be determined, because he is working to block out ore in sight, while previous managements apparently merely worked to gouge out any ore that was exposed, regardless of future development.

“During my visit, nearly 40 tons of ore per day were being mined and hauled to the smelter from the development workings. No stoping was being done.

“I am of opinion that there is sufficient ore in sight in the *Van Anda* mines to keep the smelter running for a year at least, but, of course, until the various levels are connected and the continuity of the ore bodies determined, it is practically impossible to measure up with any degree of certainty the ore in sight.

“With regard to the ore body on the 400-foot level in the *Copper Queen*, one feature which is encouraging, but rather unexpected, is that it carries gold values which average up with the shipping ore near the surface, while the copper values have not decreased.”

TEXADA ISLAND.

REPORT OF H. CARMICHAEL, PROVINCIAL ASSAYER.

The best known properties on Texada Island are those held by the Van Anda Mines. Van Anda Copper and Gold Co., of which H. W. Treat is President and General Manager, while Thos. Kiddie is Superintendent of the Company's smelter on Van Anda Bay. The principal claims are the *Cornell*, *Copper Queen*, *Little Billy*, *Raven*, *Florence*, etc.

On this property, situated in the immediate neighbourhood of Van Copper Queen. Anda Bay, development work has been proceeding steadily beyond that described in the Report of last year.

At the time of my visit, the main shaft (known as the Van Anda shaft) had reached the 400-foot level and sinking was being continued. The drifts begun last year, at the 175-foot level, had been discontinued after being run a short distance, while at the 224-foot level, two short drifts had been run and a small quantity of ore stoped. The principal work, however, had been done at the 300-foot level where four drifts, each about 100 feet long, had been run in different directions. In each of these felsitic ore-bearing matter was found, which continued for some distance but gradually merged into limestone in which no ore was visible. On the last-mentioned level, near the shaft, a body of good ore, consisting of bornite and chalcopyrite, had been struck and was being stoped out. An upraise was being driven at this point to connect with the 224-foot level.

From the development work done it appears that, with few exceptions, the ore is contained in the felsitic matter mentioned and does not penetrate into the surrounding limestone.

A shaft house, new hoisting apparatus and an air compressor, all in good order, have been installed.

The *Cornell* mineral claim is situated about three-quarters of a mile south of the *Copper Queen*, and a considerable amount of work has been done on the property, but unfortunately, a slide, which occurred a short time previous to my visit last September, had closed the entrance to the workings and prevented any examination of them. Two tunnels were being driven to tap these former workings.

Substantial ore bins had been erected and compressed air for the drills was being conveyed by pipe from the *Copper Queen*.

This Group, consisting of the *Raven*, *Chief* and *Joan* claims, is situated on Spratt's Bay, about three miles south of Van Anda townsite and was described in the Annual Report of 1897. Since then the Van Anda Copper and Gold Co. has taken over the property, and at the time of my visit, the ore was being taken out on a contract and shipped by water to the Company's smelter.

The ore now being mined is principally magnetite with a little copper pyrites. The copper values are low, but since iron ores are required for the running of the smelter, the property can be profitably worked.

A clearly-defined ore chute, 8 to 10 feet wide, is traceable on the surface for a considerable distance; the wall rock is principally gabbro. Along this chute a tunnel was being run from the south side of the ravine to tap the bottom of the shaft which had been sunk to a depth of 130 feet. There was a good showing of ore in the tunnel of the same nature as that on the surface. Twelve men were at work on the property.

Security. This claim is situated a short distance south-west of the Company's smelter and is connected therewith by a good road. Development has been carried on by a series of open cuts, which have exposed a body of solid magnetite, carrying a little copper pyrites, and, it is said, small gold values. The property is well situated for easy transit of the ore to the smelter and it was being teamed thither at the time of my visit.

A telephone system has been established between the different properties of the Van Anda Co.

Van Anda Smelter. The Van Anda Copper and Gold Company's smelter is situated on Van Anda Bay, where a wharf, extending out into the bay for 400 feet, and at the end of which there is 23 feet of water at low tide, has been erected. A good waggon road runs from the *Copper Queen* shaft to this wharf, while an inclined tramway and hoist connect the latter with the upper levels of the smelting works, and these levels, in their turn, are connected by a trestle with the roasting grounds and lime quarry. At the head of the inclined tramway are the three ore bins and dumpage for 1,000 tons of coke, and at right angles to the ore bins are the sampling works. In this way all material received by water (coke, ore, etc.), can be at once hoisted, weighed, sampled and either dumped into the bins or run back on to the roast piles.

PLANT.

The smelter plant proper consists of a matte, furnace, engine and boiler shed, in all 107 feet by 35 feet 6 inches.

Power. One 80 h. p. tubular boiler, with $3\frac{1}{4}$ -inch tubes, and a stack 60 feet high; one 40 h. p. engine, and one boiler feed pump.

Equipment. One 42-foot copper-lined cupola furnace; two Connersville blowers, with 14 inch discharge; one Jeansville pump, 4 by 8; one Blake crusher, 4 by 10 inches; and one dust chamber, 30 by 10 feet, 7 feet high, fitted with one large iron door in the end and three side doors to facilitate cleaning, and connected with the furnace by a goose-neck 36 inches in diameter.

In the furnace room the charging platform is 11 feet above the floor, while the track platform is 16 feet above, leaving dumpage of 5 feet between the two levels. Near the scales are recesses for cracked iron ore and lime.

Sampling Works. These are placed at right angles to the bins, with a 12 by 14 Blake crusher between, elevated so that the ore or flux can be passed through the cracker directly into the cars and trammed to the furnace room ready for use. The cracker is also fitted with an automatic sampler, the samples being trammed into the sampling department, where they are passed through a pair of 24-inch rolls, and finally through a grinder; the power for the cracker, rolls and grinder is obtained from a 20 h. p. vertical engine, supplied with steam from the smelter boiler. Besides these there is all the ordinary paraphernalia common to the best equipped sampling works.

Water. The water supply is obtained from Van Anda Creek by a flume, and is pumped to an elevation of 80 feet into a storage tank, 20 by 10 feet; from here it discharges to the furnace, the boiler being fed by the waste hot water of the jackets. Fire hydrants are placed in each department, with a proper supply of hose.

The fuel used for the boiler is mostly obtained as slabs from the Company's saw-mill, a trestle having been constructed from the mill to the smelter for this purpose.

Other buildings comprise a carpenter's shop and blacksmith's shop, with oil room and store rooms. A new assay office is also under construction, consisting of analytical room, furnace room, balance room, stoke room and office.

The ore from the *Copper Queen* and *Cornell* mines is brought down by teams, weighed and delivered directly to the roast piles, where it is burnt in open heaps; the fines or screenings are spread out as a bed upon which the cordwood is placed. After being roasted the ore is filled into cars and run to the furnace scales; the requisite amount of flux is then added, and the whole is dumped on the charging platform behind the furnace.

This property, owned by Wm. Christie and J. J. Palmer, is situated
Marble Bay on Marble Bay, and was described in last year's issue of this Report. It is
Mineral Claim. under the superintendence of Mr. F. W. McCready. Development has been continued by further sinking the shaft, which is now down 170 feet, in addition to which the drifts at the 70-foot level have been extended for a total distance of 572 feet, and, at the end of one of these drifts, an upraise has been made to the surface. Again, at the 140-foot level, drifts have been run for a total distance of 312 feet, and work on these was still in progress at the time of my visit.

The drifts have followed the felsitic matter, which, as in the *Copper Queen*, appears to carry the ore. In some of the drifts which have been extended for a considerable distance, this felsitic matter blends with the limestone, and all trace of the ore is lost. The above development has not disclosed any large or well-defined body of ore.

This lime-kiln was erected during the early part of last year, on the
Marble Bay deep water at the west side of Marble Bay. It has the same owners and
Lime-kiln. management as the *Marble Bay* claim. The kiln, which is 30 feet high above the draw floor, is of solid masonry, lined throughout with the best fire-brick. The limestone used is quarried immediately adjacent to the kiln, and is of a very fine quality, as shown by the following analysis:—Calcium carbonate, 97.5%; silica, 1.8%; iron oxide, 0.09%; alumina, 0.7%. Burning was begun in August last, and some 4,000 barrels of lime, which is very white and is said to have given good satisfaction, were sold. Wood is the fuel used, the ash being thus reduced to a minimum. A wharf and a lime-shed having a capacity of 3,000 barrels, have been erected at the kiln, and the property possesses every facility for the cheap burning and transportation of lime.

This group, owned by J. McConville and M. Galbraith, of Van Anda,
Crown Prince consists of nine full claims, but development is being carried on principally
Group. on the *Crown Prince*. The property is situated on the east coast of the Island, about $1\frac{1}{2}$ miles from Pocahontas Bay, at an elevation of some 700 feet, and is approached by a good trail.

Several open cuts on the *Crown Prince* have disclosed a clearly-defined ore chute about 30 inches wide, consisting of solid magnetite and copper pyrites, magnetite predominating, in a mixed gangue of diabase and lime. The walls are diabase, and the ore body has a strike N. 65° W., with a dip to S. 50° W. of 55°. A little distance below the outcrop a short tunnel had been run in, and the lead drifted on for a few feet either way, but the ore chute did not show up so clearly as on the surface, and appeared to be mixed with the country rock. Sufficient work had not been done to demonstrate the continuance or otherwise of the ore body. I was informed that 2,100 lbs. had been shipped to the Van Anda smelter, and had returned a value of \$13.50 in gold per ton.

It would be of interest to know whether (as appears to be the case) the magnetites on the east coast of Texada Island carry gold values to any extent, since the values obtained from the massive magnetites on the west coast have been, so far, exceedingly small.

Iron Mine. This mine, owned by the Puget Sound Iron Co., W. H. Lee, superintendent, is situated on the west coast of Texada Island, and is reached by a rough waggon road from Van Anda, a distance of about six miles. The property, described in a previous issue (1897) of this Report, has a shaft now sunk to a depth of 150 feet. The first level is at 70 feet, where two drifts of 30 and 55 feet have been run, but the entrances to these being boarded up, I was unable to examine them. At the surface were several tons of medium grade copper ore mixed with magnetite, sacked up ready for shipment to the Van Anda smelter. This, I was informed, came from the 70-foot level.

From the bottom of the shaft two drifts had been run, one of 35 feet and the other of 300 feet; the latter was being continued under the hill to tap an outcrop of magnetite showing on the surface. These drifts ran through a fine-grained igneous rock, with here and there a little pyrites, but I could see no ore in the faces.

REPORT BY MARSHAL BRAY, GOLD COMMISSIONER.

I have the honour to submit my fourth Annual Report for the Nanaimo Mining Division for the year ending 31st December, 1899.

The revenue for the year ending 31st December, 1899, has been \$7,318.35, to which must be added mineral taxes paid for year, \$16.72, making a total of \$7,335.07. This is an increase of \$844.98 over the revenue collected for the year ending 31st December, 1898.

I have 1,016 records of mineral claims in good standing on the 31st December, 1899. There has been more development work done in this Mining Division during the year 1899 than in any past year.

TEXADA ISLAND.

The development work done on Texada Island for the year 1899 has been greatly in excess of any previous year's, and we are beginning to feel the benefits thereof.

Van Anda. The Van Anda Copper and Gold Company has been busy during the year in sinking the *Copper Queen* shaft down to the 400-foot level, and stopping ore from the upper levels, and has struck a large body of very rich bornite ore. During the earlier part of the year a fine new hoisting plant, built by Jenckes Manufacturing Co., of Sherbrooke, Que., was put in, consisting of a double hoisting engine, air compressor, and boilers. A large engine house, new shaft house, and ore bins with sorting tables were also erected. It has been decided to sink to the 500-foot level this year.

In the *Cornell* mineral claim, another of the Van Anda properties, a fine outcrop of copper ore was opened up in the early part of the year, and a rich body was found from the start. Shortly after, a second outcrop was found, and a shaft was begun, a frame for hoisting erected, and large ore bins built, with the necessary sorting tables. The Company drove in two tunnels from the base of the hill to tap the ore body, and has built a waggon road to the smelter, a distance of about $1\frac{1}{4}$ miles, over which they are hauling ore.

The *Security* mine, also owned by the Van Anda Company, has been opened up on an outcrop, and has supplied a quantity of iron ore to the smelter for flux.

The *Raven*, also owned by the Van Anda Company, has been working since midsummer, and has shipped ore to the smelter.

Smelter. The Company erected a smelter of 50 tons per day capacity, started same on the 15th day of July, 1899, and has been smelting its own and other ores constantly from the said date until the close of the year. The Company smelted about 5,000 tons of ore during this $5\frac{1}{2}$ months, and shipped about 450 tons

of matte to a refinery in the East. The matte contained about 50 % of copper and very good values in gold and silver. The ore used was obtained from the *Marble Bay*, *Raven*, *Copper Queen*, *Cornell*, *Jack North*, *Security*, *Mount Sicker*, and other mineral claims.

The Marble Bay Company has been developing its property, and has
Marble Bay. mined a considerable quantity of fine copper ore, part of which has been smelted at the Van Anda smelter, while there is quite a quantity in the ore bins ready for treatment.

This Company has erected a lime kiln at Sturt Bay, and has burned and turned out considerable lime of good quality.

On the *Jack North*, owned by the Puget Sound Iron Company, development work during the year has been pushed, and has proved the claim to be a good copper mine. The Company shipped about 2,000 tons of iron ore to the Everett smelters, Washington, and about 100 tons to the Van Anda smelter, to be used as a flux.

The *Lorindale*, *Potosi*, and other Companies on the west side of the island have not done much development work during the past year. The Puget Sound Iron Company's mine and the *Vulcan Group* are the only properties on the west side of the island which have shipped ore to the smelter during the year. The ore from the latter is copper and gold, with a small silver value, and teams can take from 40 to 50 sacks to the load over the trunk road across the island.

The two towns of Texada and Van Anda, which adjoin each other, have grown greatly in 1899, and they now have a population of about 600, with hotels, club room, stores, saw-mill, shops, postoffice, public school, printing office, church, and two commodious wharves.

SHOAL BAY.

Shoal Bay section of Nanaimo District takes in the islands of Thurlow, Valdes, and Channe, and that portion of the Mainland lying between Euclataw Rapids on the south and Loughborough Inlet on the north.

A large amount of work has been done on the *Doratha Morton* mine
Doratha Morton. on Fanny Bay, owned by the Fairfield Exploration Syndicate, and which has turned out from December, 1898, to October, 1899, inclusive, \$90,000 in gold and silver bullion. In October operations were stopped. The Company had its own plant on the ground and crushed between twelve and fifteen thousand tons of ore, which was treated by the cyanide process.

Numerous other mineral claims on the same lead had considerable work done on them in 1899, notably the *Alexandria*, at the entrance of Philipps Arm and south-west of the *Doratha Morton*, and the *Champion*, about $2\frac{1}{2}$ miles north-west of the *Doratha Morton*, besides a group of claims owned by the Cuba Silver Mining Company and situated on the north-west end of Loughborough Inlet, on which a large amount of tunnelling has been done. The ore from the latter group carries too high a percentage of copper for treatment by the Cyanide process.

The *Blue Bell's* lead extends from the shore on the west side of Frederick Arm, on the Mainland, across the peninsula between Frederick and Philipps Arm, and from thence under Philipps Arm and is picked up again just north of Hewetts Point, at the entrance of Fanny Bay, and can be traced thence over three more claims. The vein-filling is a glassy white quartz impregnated with pyrrhotite and a small amount of copper pyrites, zinc blende and galena. High values have been obtained from the *Blue Bell* mine, the principal property on this lead, situated above the west shore of Frederick Arm. Ore has been mined from this property, but so far none has been shipped, the owners having confined their attention entirely



SINGLE LOG BRIDGE OVER CANYON—WEST COAST V. I.



MOUTH OF INCLINE—MOUNTAIN CHIEF GROUP—ALBERNI M. D.



to development work of which a large amount has been done, there being two tunnels, one 125 feet and the other over 200 feet, all run in 1899, besides several open cuts and a stripping of the lead on the surface for hundreds of feet.

There are several other promising claims on this same lead, but on these only the requisite assessment work has been done.

The *Douglas Pine* lead extends nearly across Thurlow Island, running from Nodales Channel, on the east side, diagonally across to Shoal Bay, a distance of about two and a half miles. The vein-filling is quartz, impregnated with pyrrhotite and occasionally small amounts of copper pyrites. The chief work on this lead was done on the *Douglas Pine*, situated on the hill overlooking Shoal Bay. A shaft was sunk 125 feet with several drifts extending from the same, another shaft about 50 feet deep, and several tunnels and open cuts. Some tons of ore have been shipped to Van Anda smelter and to Everett. Several other claims on this lead have been worked, getting good values in gold, but so far no ore has been shipped from them.

There are many other properties in the vicinity of Philipps Arm, notably that of the B.C. Exploring Syndicate, at Estro Basin, on which has been opened up a very fine vein with chalcopryite ore, by running a tunnel 240 feet, tapping the ledge at 215 feet depth.

The *Ajax* mineral claim, situate on the west shore of Valdes Island, in Deep Water Bay, has proved to be a copper property. Just across Discovery Passage from the *Ajax* and situate on Vancouver Island, is the *Sunset Group* of claims, another copper property, on which the owners have been working steadily during 1899. They have run two tunnels, one 45 feet and a lower one 80 feet, in which two winzes have been sunk, each 30 feet. The owners are well pleased with the results and are about to drive another tunnel to tap the lead at the 200-foot level. The *Monte Cristo* and *Bonaparte* claims, situate on Philipps Arm, are being developed and are showing fine chalcopryite ore.

There are a number of other mineral claims at Shoal Bay, Philipps Arm, Frederick Arm, Valdes Island, Stewart Island, Craycroft Island, and other islands, and on Jervis Inlet, Toba Inlet, Bute Inlet, Loughborough Inlet, Knight's Inlet, and Kingcome Inlet—in fact, all the distance along the coast line to the head of Vancouver Island—that have had considerable development work done on them in 1899.

HORNE LAKE.

Considerable development work has been done at Horne Lake, situated on Vancouver Island, about eight miles back from the sea coast. The principal work has been done on a group of claims composed of the *Beaver*, *Duntellum*, *Gold Ridge* and *Mary Fletcher*. The ledge on these claims has all the indications of a true fissure lode, and cross-cuts the general formation of the country. The work done on this group in 1899 consisted in stripping the ledge on the surface in three places, sinking one shaft 35 feet, sinking a second shaft 65 feet and a cross-cut from the bottom of same 13 feet, and sinking No. 3 shaft, about 2,000 feet to the north of No. 1 shaft, to a depth of 32 feet.

Much more work, on a small scale, has been done in the vicinity of Horne Lake, with very gratifying results, as far as surface showing goes.

CAMERON LAKE.

Some work has also been done at Cameron Lake by the Cameron Lake Mining Company, which has run its tunnel about 100 feet further towards where the lead is supposed to be.

The development work done in Dunsmuir District has been principally on a group of eight claims owned by the Jubilee Partnership Company. These claims are situate on

Green Mountain, about 13 miles from the second Nanaimo Lake. A second tunnel was driven 450 feet in 1899, and the ledge was tapped at a depth of 250 feet from the surface. The first tunnel, which was driven in 1898, tapped the ledge at a depth of 90 feet from the surface. A number of other claims on this mountain are preparing to do development work during the coming year. There is a good waggon road to the upper end of the second Nanaimo Lake, which is 17 miles from Nanaimo, and a good trail from there to Green Mountain.

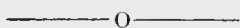
The mineral claims located during the year ending 31st December, 1899, are situated in the following places throughout the Nanaimo Mining Division, viz. :—

Texada Island	155	<i>Brought forward</i>	277
Valdes Island	8	Sayward District	8
Helmcken Island	9	Cameron District	26
Cracraft Island	8	Comox District	3
Redonda Island	8	Hotham Sound	2
Thurlow Island	10	Philipps Arm	68
Klaoitsis Island	1	Powell Lake	22
Read Island	4	Frederick Arm	10
Harbledown Island	1	Call Creek	9
Stewart Island	4	Rupert District	4
Channe Island	1	Loughborough Inlet	23
Johnston Strait and Menzies Bay .	3	Bute Inlet	3
Theodosia Arm	4	Knight's Inlet	11
Jervis Inlet	14	Toba Inlet	13
Dunsmuir District	29	Ramsay Arm	1
Wellington District	3	Nelson District	7
Newcastle District	3	Beaver Harbour	4
Nanoose District	12	Sunderland Channel	2
<i>Carried forward</i>	277	<i>Total</i>	493

OFFICE STATISTICS—NANAIMO MINING DIVISION.

Free miners' certificates issued	412
Mineral claims recorded	493
Placer claims recorded	1
Placer claims re-recorded	1
Hydraulic mining lease	1
Certificates of work recorded	572
Paid \$100 in lieu of work	15
Certificates of improvements recorded	34
Bills of sale recorded	190
Abandonments recorded	1
Crown grants issued	34

VICTORIA DISTRICT.



VICTORIA MINING DIVISION.



REPORT BY W. S. GORE, GOLD COMMISSIONER.

I have the honour to submit herewith my report of mining operations in this Division during the year 1899:—

I am indebted to the courtesy of Mr. H. Croft for the following reports on those claims situated on Mount Sicker and in the San Juan Valley, and to Mr. Phair, of Goldstream, for the report on those situated on Mount Skirt.

MOUNT SICKER.

On this mountain there are some fifteen claims, owned by the Mount Sicker and British Columbia Development Company

The work done has been principally on the main vein running through **Lenora Mine.** the *Lenora*, a Crown-granted, full sized claim. This mine is distant from Westholme Station, on the E. & N. Railway, about six and a half miles, and is at an elevation above the sea of about 1,400 feet. The development work consists of a tunnel of 547 feet, with cross-cuts amounting to 210 feet, and a shaft sunk 200 feet, from the bottom of which a cross-cut drift has been run 140 feet. The ore body has been proved at the different levels, and in the outcrops, at a number of places along the strike of the vein.

The width of the ore body varies from 3 feet 6 inches to 20 feet. At the present time it is estimated that there is in the ore shed ready for shipment about 600 tons of ore and about 1,500 tons on the dump, consisting of first and second-class ore, the latter going about \$12 per ton. About 1,500 tons of ore have been shipped, and it is estimated that when the horse tramway is completed, on the 1st February, 1900, the output will be 1,500 tons per month.

The average returns from the smelter of the ore shipped is: Gold, 1.8 ounces; silver, 3.8 ounces; copper (dry), 9.2 %. The ore is very uniform in value, and consists of about 22 % iron and 24 % silica, with chalcopyrite. The vein has been proved to the 200-foot level, and there is every reason to believe that it runs to a great depth. The ore is easily mined and at a low figure, the country rock being very soft, consisting of mica, talcose and graphitic schists. On the other claims owned by the Company numerous veins exist, but only ordinary prospecting has been done. Timber is plentiful, and the Chemainus River affords good water power for mining purposes.

SAN JUAN VALLEY.

The *Buena Vista* mineral claim is situated on San Juan Harbour. A shaft, 25 feet deep, has been sunk, with a 9-foot cross-cut at the bottom, in a quartz ledge carrying copper, gold and silver; a short tunnel has been driven through slate (the country rock) into the same vein, and there is every indication that the lead will continue with depth. There are many other claims in this camp on which development work is being done.

MOUNT SKIRT, GOLDSTREAM.

On the *Ralph* claim, one of a group on this mountain, 1,300 feet of work, at a cost of \$13,000, has been done. The ledge is 15 feet in width, and in it there is being worked a chute of solid chalcopyrite ore that averages from 6 inches to 4 feet in width. On this chute a drift has been run for 100 feet, and a shaft sunk for 160 feet. In the course of development 200 tons of high grade ore has been taken out, which will average 15 % copper, with gold and silver values.

On another part of the ledge about 500 tons of second grade ore has been taken out, which will run 5 % in copper. No ore has been shipped, but it is the intention to do so as soon as a waggon road shall have been built this coming spring.

OFFICE STATISTICS—VICTORIA MINING DIVISION.

	1898.	1899.
Free Miners' Certificates issued	1,242	1,540
Mineral Claims recorded	392	259
Placer "	12	1
Certificates of work issued	195	197
" improvements issued	17	26
Grants of Water Rights for Mining	2	7
Lay-overs	18	.
Placer Leases . . . . .	.	3
Conveyances	115	142
Abandonments	8	6
Crown Grants issued . . . . .	.	11
Revenue derived—		
Free Miners' Certificates	\$13,836 00	\$10,661 24
Mining Receipts, general	4,037 00	3,053 05
Total	\$17,873 00	\$13,714 29

NEW WESTMINSTER MINING DIVISION.

REPORT BY D. ROBSON, MINING RECORDER.

I have the honour to submit the following report respecting mining operations in this Mining Division during the year 1899 :—

The result of mining operations generally in this Division during the year has been rather disappointing. While quite a number of the properties show indications of richness, the cost of development is found to be too great for the resources of the owners. The only properties on which work has been carried on to any considerable extent are the following: *Providence Group* (Harrison Lake), expenditure, \$25,000; *Golden Ears Group* (Pitt Lake), \$20,000; *Britannia Group* (Howe Sound), \$15,000. On the *Fire Mountain Group* (Fire Mountain), about \$1,000 has been expended during the year. The whole sum expended in development work during the year will be fully equal to that of last year, viz., about \$75,000.

Notwithstanding the expenditure on this group of about \$25,000 this Providence Group. year, the outlook does not seem to have materially improved, and work was practically stopped before the close of the season. The sum mentioned includes about \$6,000 invested in plant. During the year, about 450 feet of tunnelling and drifting has been done, and about 50 feet of shafting. There are about 275 tons of ore on the dump. In consequence of lack of capital, no plan of action for the coming year has been made, and it cannot be stated whether work will be continued or not.

On this group, comprising the *Champion, Rocket, Cromwell, and O. Pitt Lake Group. K.*, work has been carried on by the Dominion Mining, Development, and Agency Co., which bonded the property, and has expended about \$20,000 during the year. About 600 feet of tunnelling and 185 feet of shafting has been done on the group. The bond of the Dominion Mining, Development, and Agency Co. has been allowed to lapse, for reasons which no one seems to be able to explain. The property, which I have personally examined, certainly shows a considerable body of good-looking ore, and its proximity to deep water will facilitate economical treatment. There are about 1,500 tons of ore on the dump.

The claims comprising this group are situated on Fire Mountain, about Fire Mountain 16 miles north-west from the head of Harrison Lake. The property has Group. been taken over by the Canadian Fire Mountain Mines, Limited, having a capital of \$125,000. Only about \$1,000 has been expended during the year, but the new Company is well satisfied with the property, and intends to proceed with work in the Spring. The quartz mill placed on the claims in the Fall of 1897 proved unsuitable for the rock, and the managers intend to install a new 10-stamp mill next Spring at a cost of \$10,000. There are on the dump about 1,500 tons of ore, which is estimated to contain, on an average, about \$8 to the ton in gold. The ore, although comparatively low grade, is free-milling, and the margin of profit is sufficient to justify the Company in proceeding with the work. A fairly good trail has been constructed to connect these mines with Harrison Lake.

This group consists of 7 claims. It is situated 3 miles from the east Britannia Group. shore of Howe Sound, 28 miles north of Vancouver, and at an elevation of 3,500 feet above sea level, and is reached from Howe Sound by a good horse trail about 4 miles in length. During the year, about \$15,000 has been spent on the property. Underground work to the extent of about 375 feet has been done, consisting chiefly of a cross-cut tunnel on the *Jane*. This tunnel has cut a body of copper ore, 26 feet in width, at a depth of 130 feet from the surface. The length of the ore body has not been determined, but, from surface indications, it seems to be several hundred feet. The assays show a good percentage of copper and a small quantity of gold and silver. Some of the claims composing this group were located about 20 years ago, but the locators were looking for gold, and placed comparatively little value on the copper. It is only within the present year that the value of the property has been made apparent, and much interest is now manifested in it. It is expected that a large number of miners will be in this part of the Division in the early Spring, and already quite a number of new claims have been located as a result of developments on the *Britannia Group*. With such a large body of ore so near deep water, there is every reason to expect a profitable enterprise. The property is controlled by the Britannia Copper Syndicate, with head office at Vancouver. About a dozen men are now at work on the property, and, if future developments justify present prospects, these mines will be shippers before the close of the century.

There are a considerable number of mineral claims lying in various parts of the Division on which more or less work has been done, but the lack of capital and the great cost of opening up these properties have prevented them from being properly proved.

OFFICE STATISTICS—NEW WESTMINSTER MINING DIVISION.

	1898.	1899.
Free miners' certificates issued.....	1,942	2,315
Mineral claims recorded	332	240
Certificates of work recorded	348	211
Certificates of improvement recorded.....	—	13
Conveyances recorded	98	81
Claims Crown granted	—	6

Mining Receipts.

Free miners' certificates.....	\$16,044	\$16,654
Mining receipts, general	2,897	1,490
	<u>18,941</u>	<u>18,144</u>

NEW WESTMINSTER MINING DIVISION.

HOWE SOUND COPPER PROPERTIES.

During the last months of the past year (1899), there were reports of the existence of valuable and extensive copper deposits on Howe Sound. There is no doubt but that there is some foundation for these reports and that surface showings of very considerable extent, carrying an appreciable percentage of copper, have been discovered, but it is as yet premature to estimate their value from the development done. The properties about Howe Sound have not been investigated by this Department, and for the following description I am indebted to the courtesy of Mr. W. M. Brewer, a mining engineer and correspondent of the Engineering and Mining Journal, who visited the neighbourhood about the end of January, 1900.

PROSPECTS ON HOWE SOUND.

About Christmas, 1898, some trappers discovered a zone of mineralized schist of considerable extent, on the east side of Howe Sound, and located the *Britannia Group* of mineral claims, situated about 30 miles northerly from Vancouver. The discovery was reported to Boscowitz and Company, a firm of fur buyers of Victoria. An examination by these gentlemen led to their acquiring an interest in the claims, and work was commenced to determine what value the prospects possessed. This has been carried on until the present day, and it is only recently that the attention of mining men in the Province has been called to the fact.

Within the past month several mining operators and experts from the United States have been visiting this section and have acquired seven-tenths of the property from the Boscowitz firm. On the 27th January, the writer had the opportunity of examining the underground workings of this group. He found the camp situated about four miles from the beach by trail, and at an elevation of 3,500 feet above sea level. Thirteen hundred feet of this elevation is gained within a distance of about three-quarters of a mile. Although no snow had fallen in the near neighbourhood of Howe Sound, yet at an elevation of 2,000 feet there had been a sufficient fall to cover the surface, and the depth of this mantle increased until, in the camp

itself, it was some four feet deep. Consequently, it was impossible to make any thorough exploitation of the surface showings except at two or three points where the snow had been shovelled away and open cuts had been run to expose the outcrop.

Beyond the fact that the belt of schist apparently extends from the beach of Howe Sound, with its line of strike about 20 degrees south of east, to some distance beyond the limits of the *Britannia Group*, it was impossible during the brief visit the writer made to the district to determine the geological characteristics. Along the trail the formation is almost entirely hidden by débris from slides. Several mineral claims have been located under the name of the *Goldsmith Group* and extend from the shore line to the western boundary of the *Britannia Group*. Easterly from the *Britannia Group* 11 mineral claims have been located on what is supposed to be an extension of the ore body already discovered. Consequently, as each claim is supposed to occupy an area of 1,500 feet by 1,500 feet, these locations extend for a total distance of about six miles in an air line.

Several outcrops on the *Britannia Group* occur in the form of bold bluffs, an examination of which caused the writer to form the opinion that a considerable thickness on the foot-wall side had been carried off by erosion. The belt of schist is probably eruptive, having derived its "schistosity" from shearing. Its thickness cannot be determined as long as the surface is covered by snow, but the main cross-cut tunnel has been driven a distance of about 220 feet in the schist, which is heavily mineralized with white iron and occasional "splotches" of copper pyrites for nearly the entire distance. This cross-cut is being driven with the expectation of intersecting an ore body which has been opened on the outcrop by an open cut. That cut demonstrated that a zone in the schist carried copper pyrites, as impregnations with the white iron, in sufficient quantity to warrant the presumption that an extensive body of concentrating ore occurred, having the same line of strike and practically the same dip as the schist itself.

The level of the cross-cut tunnel is about 140 feet below the outcrop. At a point 132 feet from the mouth of the cross-cut drifting was started, apparently in the belief that ore carrying values had been reached. This work was done before the property was acquired by the Americans. After a careful examination by the experts of the latter, it was decided that the material in this drift did not represent the ore as exposed on the surface and consequently a cross-cut was started from the breast of the drift in a southerly direction and continued until a body of ore 26 feet in thickness had been traversed.

From its general appearance and the yield from assays, this body of ore, while not possessing sufficient average value for direct shipment, could be concentrated with very satisfactory results. The results of assays reported by the American Syndicate showed about 6 % in copper with low values in gold and silver, from samples representing an average of the entire 26 feet. A drift was then started in ore, along what was presumed to be the foot wall. This was run about 30 feet, and work was then suspended at that point. From the appearance of the cross-cut through this body of ore, the writer is of the opinion that no well-defined walls enclose the body, but that the ore occurs in a zone or zones in the mineralized schist, and probably, judging from the thickness of the cross-cut at this particular point, that these zones will be found to possess considerable extent.

After suspending work on the drift, it was concluded to continue the main cross-cut tunnel, with the expectation of intersecting the same ore body at another point along its line of strike, and three shifts are now working to accomplish that end. It is also proposed by the management to connect the cross-cut level with the outcrop by an upraise, as well as continuing the work of drifting.

At first sight it would appear as though it would have been more advisable to continue working in the drift instead of attempting to cross-cut the ore body at another point on the same level, but an examination of the workings demonstrated that, as the main cross-cut is run on a straight line, while the cross-cut to the west has been made after considerable "angling," it will be more economical to transport ore through the straight rather than through the crooked tunnel.

The face of the main cross-cut tunnel, at the time of the writer's visit, was still in the schist mineralized with white iron, but it is expected that only a short distance will have to be driven to intersect a body of ore carrying practically the same values as the 26-foot body. As previously stated in this article, the outcrop in places occurs in bold bluffs. About 500 feet easterly from the mouth of the main cross-cut tunnel is situated the most prominent of these. On the northern side, erosion has carried off a vast quantity of the schist of which the bluff is composed, and all of its face which is uncovered by snow shows oxidized material, which would warrant the presumption that such forms the capping of an ore body. Acting on this presumption, the management selected a point about half-way up the bluff for prospecting, and started a cross-cut tunnel. At the time of the writer's visit, although only a few feet had been run, mineralized material which was being extracted carried a considerable amount of copper pyrites associated with white iron. From its general appearance, it may be presumed that this ore will carry about the same values as that in the 26-foot ore body already referred to.

After as careful an examination of the property as could be made under the present conditions, the writer drew the following conclusions, viz. :—

That possibly the entire belt of schist carried some values.

That the 26-foot ore body certainly possessed sufficient values to make it a valuable concentrating proposition, provided, of course, its continuity is maintained, both along the line of strike and with depth.

That although, for the amount of work done, a very good showing was made, yet that it was impossible, until upraises and drifts had been run, to correctly estimate the quantity of ore in sight.

That, owing to the fact that a sufficient water-power could be obtained from a creek flowing on the property to run concentrating machinery, concentration would be the most desirable method to be adopted for treating the ledge matter.

That an aerial tramway could be constructed from the *Britannia Group* to the beach, by means of which ore could be transported at very low cost.

That, provided a sufficiently large body of ore was blocked out to warrant the erection of a smelter, smelting operations could be carried on at the minimum cost, because Howe Sound is only a short distance by water from the Union coke ovens, on the east coast of Vancouver Island.

That if the property was worked under a careful management, with a sufficiently large cash capital to install necessary machinery and work a large force of men, the *Britannia Group* ought to develop into a producing mine of great capacity.

So far as the *Goldsmith Group*, situated westerly from the *Britannia*, is concerned, there has been but little work performed on it, but the results from such work would warrant the presumption that this property should develop into one having at least as great producing capacity as the *Britannia*, while it has the advantage of being located nearer to salt water.



VAN ANDA SMELTER—TEXADA ISLAND—NANAIMO B. C.



MABLE BAY LIME KILN TEXADA ISLAND.



REPORT OF INSPECTOR OF METALLIFEROUS MINES.

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REPORT OF JAS. MCGREGOR, INSPECTOR.

I have the honour to submit my report as Inspector of Mines for the year 1899.

During that period I visited all the mines of the Province, some of them several times, and am pleased to report a marked improvement, not only in respect to the matters of which it is my duty to take cognizance, but in almost every other respect.

With reference to the provisions made for the safety of the operators, I find an improvement generally in the timbering, travelling ways, hoisting gear, and ventilation, and many other matters by which the protection of miners is insured. There is still, however, a good deal that can be done, especially in the matter of ventilation, the importance of which, perhaps more than anything else, is not sufficiently recognized by the owners.

I regret to say that there has been a number of accidents in the mines by which individual miners have been seriously injured or killed. The greatest number of these has originated in unexploded powder; in fact this has been the common cause. Little or no blame, however, can be held to attach to any one in this connection. The cause of these accidents has had my serious consideration in an endeavour to arrive at some method whereby they can be prevented. I append a list of the accidents which have occurred during the year. In every instance, when notified, I made the fullest enquiry into the cause, and was on the ground as soon after as possible. It is due to the mine-owners to say that they are improving the provisions for safety. At present very few, if any, come up to the exact requirements of the law, but there is a disposition on the part of owners to comply with these requirements as nearly as possible, or as nearly as circumstances will permit, as soon as their attention is drawn to needed changes. Of course in the development stage the same facilities cannot exist as in a fully equipped and dividend-paying mine.

In the larger mines, such as the *Le Roi*, *War Eagle*, *Centre Star*, *Iron Mask*, *Hall Mines* and others, an endeavour is being made to comply with the Government regulations, and I am satisfied that in a very short time they will all be equipped with full and due regard to the provisions of the Act.

I need not refer to the extensive operations that have been carried on in the Rossland camp, where mining has assumed an important industrial position.

In the Nelson camp the three principal mines are the *Hall*, *Poor Man* and *Athabasca*. I should like to specially refer to the well ventilated condition of the *Hall* mines.

Unfortunately, the principal mines in the Slocan District have been closed, owing to a misunderstanding between the miners and the mine-owners; for similar reasons the *Whitewater* and the *Ymir* mines have been closed down, practically nothing having been done for the greater part of the year.

In the Ainsworth Mining Division little has been done, the camp being still in the prospecting stage. There are no shipping mines.

East Kootenay has been prosperous, and, although the mines are still in the development stage, there is a good promise of a heavy output soon from several camps of that district.

The part of the Province to which the greatest attention is now being directed is the Boundary, where there are ten or a dozen mines on a shipping basis, with many others in which development is actively going on. I found the mines in good working condition, although much improvement is possible in regard to the regulations, which later on will be more easily complied with. With the advent of the railway nearly all the principal mines are installing new plants, and the conditions will be greatly improved. Owing to the lack of railway facilities in the past the "Boundary Country" has been much handicapped.

In Camp McKinney the conditions are steadily improving, although, with the exception of the *Cariboo*, the other mines there are still in the development stage. Notwithstanding the fact that it is very costly getting machinery into this country, there are a number of plants being installed.

In the Fairview Camp little progress has been made during the past year.

I did not visit the Duncan-Lardeau District, as the properties there are not sufficiently developed to warrant it. The principal want of this camp is railway communication, in order to bring in machinery; this requirement is now, however, being supplied by two companies.

I have much pleasure in observing the progress that is being made on Vancouver Island and the Coast mines. In Texada Island there are three mines, the *Iron Mine*, *Van Anda* and *Marble Bay*, in which about 75 men are at work. The *Mount Sicker* mine is in good condition. The main shaft on the *Lenora* is now down over 200 feet. At Shoal Bay considerable work was being done, but the *Doratha Morton* and the *Douglas Pine* have now closed down. Generally the progress for the year has been good, and the prospects are excellent in metalliferous mining.

Last year I made the recommendation that inclined shafts over 50 feet in depth should have iron rail guides, or wooden guides shod with iron. From my experience during the year, however, I have come to the conclusion that wooden guides shod with iron are unsafe, for the reason that the straps that are nailed or screwed on are in great danger of becoming loose when the screw or nail heads are worn off. A wooden guide alone is, therefore, much to be preferred.

LIST OF ACCIDENTS IN METALLIFEROUS MINES OCCURRING DURING 1899.

LE ROI MINE.

April	3—James Butler, scalp wound on side of head, caused by falling rock.
May	2—J. E. Miles, shoulder out of joint; slipped while climbing from one floor to another.
"	3—John Williams, fracture of leg, machine bar falling from place.
"	10—Ed. Parsons, leg injured while putting up timbers; loose rock slipped and struck his leg.
"	17—James Hogan, scalp wound, piece of rock striking him from floor above.
July	24—Robert Grant, head injured by bar striking him while moving some loose ground to place timbers.
September	12—Gus. Sandham, shoulder injured; fell through chute to floor below.

- September 12—W. Stapleton, shoulder blade broken, machine drill steel falling through floor above.
- October 30—Wm. Hawley, J. J. Cain, blasted while putting in chute; faces of both men severely hurt; supposed to have thrown hammer on some loose powder.
- November 26—W. B. Wilson, knee-cap broken; slipped into trench cut out for sill; in falling, struck knee on track rail.

WAR EAGLE MINE.

- February 1—John McDonald, leg broken; fell down opening a distance of about 10 or 15 feet in one of the stopes.
- March 27—Milo Munroe, hand crushed in machinery at compressor.
- May 1—John Fletcher, leg crushed by skip in main shaft. He was working in shaft and did not get out of the way of skip in time, getting his leg and ankle severely crushed, not broken.
- " 20—A. J. Honeyford, J. O. Palmer, Thos. Neville, W. F. Schofield, killed; Milward Crable, uninjured, but laid up for a week or more with nervous prostration. Hoist machinery out of gear for a moment and allowed skip in shaft, with five men (named above) who were on it, to run away. The skip dropped down from mouth of shaft to 625-foot level. Four killed and one badly shaken up, but uninjured.
- June 20—Duncan McMillan, injured, piece of rock striking him upon the head.
- " 23—Chas. Coulson, injured; Chas. W. Sturgis, Chas. Lee, Mike Griffin, Dan Greene, killed. In blasting of a missed hole on the 625-foot level of mine (carelessness of the men themselves). Four were killed, and one fell, having his hand badly hurt; in hospital about two weeks.
- November 1—John Nelson, leg broken and badly injured by falling rock in 375-foot stopes. Died in hospital about a week after the accident, from general peritonitis, which set in.

CENTRE STAR MINE.

- April 3—Mack Cooke, killed by blast. His own carelessness, in getting in way of regular blast.
- June 17—Wm. Miller, arm injured slightly; caught between the top of hoisting skip and floor of the station in shaft.
- August 25—Cassia Dickson, knee-cap split; rendered stiff-legged. Fell into opening of ore bin on surface.
- October 19—Chas. Mansfield, injured slightly. A falling rock struck him in the back.

MISCELLANEOUS.

- May 6—In the Jewel Mine (Boundary), John Spargo killed, and T. Thomas Edwards injured by connecting upraise with shaft filled with water, the blast shattering the rock, and shortly after they returned the water broke through.
- August 9—In Slocan Sovereign Mine, Sandon, E. S. Williams killed and H. E. Crouse injured, by blast.
- November 21—B. C. Mine, A. M. Watson, lost eyesight from blast, and W. McBride and W. Esanchoy injured.
- June 16—In Sunset Mine, Rossland, Clarence Edwards, injured by bucket.
- July 5—Iron Mine, Texada Island, F. Jell, killed by blast.
- August 8—T. McWilliam and — Roberts, killed by drilling into an old hole which contained unexploded powder.

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- August 21—In the Highland Light Mine, Nelson, A. Blair and — Thomas, injured by unexploded powder.
- December 21—In the Iconoclast Mine, West Fork of Kettle River, Chas. Peterson, killed by fall of rock.
- “ 23—John Nelson, killed, south drift of the 200-foot level. Cause, unexploded powder.
- “ 23—J. D. McLeod, injured, south drift of 200-foot level. Cause, unexploded powder.
- May 11—In the Old Ironsides Mine, Phoenix, John Swanson, leg broken by fall of rock.
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COAL MINING IN THE PROVINCE.

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The general distribution of coal throughout the Province was dwelt upon at some length in last year's Report, and it will consequently be only necessary this year to note such progress and new developments as have been made during 1899.

Outside of the established coalfields, viz.: Vancouver Island Collieries and those of the Crow's Nest Pass, there have been no important developments.

In the neighbourhood of the valleys of the Babine and Bulkley Rivers, Babine and Bulkley Valleys. in the Skeena Mining Division, there has been some exploring of the coal deposits there found, and I am told by the gentleman in charge of the work that he has met with such success in this matter that his principals intend to seriously open up the properties they have secured. Owing to the remoteness of these coalfields from any transportation routes to the outside world, the owners can only, at present, hope to dispose of their product to such of the local fuel consumers as have not their requirements supplied by wood.

The value of these deposits, both to the country and to their owners, is only as a reserve and a guarantee for the future opening up of this section of country.

There are some well authenticated reports of the discovery of coal in the Atlin District, but as yet no reliable detailed information is to hand as to the extent of the beds or the quality of the coal. Should these reported discoveries turn out to be workable deposits, they may have an important bearing on the progress of that District, where the winter is long and severe, and such supply of wood as is available is needed for lumber.

Of the coal deposits of the Nicola Valley, Peace River, Skeena River and Queen Charlotte Islands, nothing new has been learned this year.

CROW'S NEST PASS COLLIERIES.

I reported on the initial development and plant of these collieries last year, since when they have become a factor in our Provincial development, having this year produced about 103,000 tons of coal and made nearly 30,000 tons of coke, supplying the inland coal market and sending a considerable tonnage of coke to the United States.

At *Coal Creek Colliery*, the coal measures have not proved to be as regular and uniform as they promised to be from preliminary development, several faults having been struck, though none of sufficient importance to interfere with the value of the property.

The same Company (the Crow's Nest Pass Coal Co., Ltd.) has since opened up two other mines, the *Michel Creek Colliery* and the *Erickson Colliery*, which are as yet only in the development stage and have shipped only a few hundred tons.

The following are the official returns from these collieries for the year 1899 :—

COAL MINES REGULATION ACT.

Returns for the year ending December 31st, 1899, from Coal Creek Colliery, Fernie Town, South-East Kootenay District.

Operated by THE CROW'S NEST PASS COAL CO., LTD.; head office at Toronto, Ont.

OFFICERS.

Hon. George A. Cox, President, Toronto, Ont.

Robert Jaffray, Vice-President, Toronto, Ont.

J. A. Gemmill, Secretary, Ottawa, Ont.

E. R. Wood, Treasurer, Toronto, Ont.

James Johnstone, C.E., General Manager, Fernie, B.C.

Capital of Company, \$2,000,000.

Value of Plant, \$150,000.

SALES AND OUTPUT FOR YEAR.	COAL. (Tons of 2,240 lbs.)				COKE. (Tons of 2,000 lbs.)			
	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.	Tons.	cwt.
Sold for consumption in Canada	62,338	.....			23,377			
" export to U. S . . . . .		.....			5,750			
" " to other Countries . . . . .		.....				
Total Sales . . . . .		.....	62,338					29,127
Used in making Coke	38,272	.....					
" under Colliery Boilers, &c	2,000	.....					
Total for Colliery Use . . . . .		.....	40,272					
Stocks on hand first of year . . . . .		.....				
" last of year . . . . .		.....			531			
Difference added to Stock during year . . . . .		.....						531
Output of Colliery for year . . . . .		.....	102,610					29,658

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, &C.

CHARACTER OF LABOUR.	UNDERGROUND.		ABOVE GROUND.		TOTALS.	
	No. Em- ployed.	Average Daily Wage.	No. Em- ployed.	Average Daily Wage.	No. Em- ployed.	Average Daily Wage.
Supervision and Clerical Assistance			9	\$5 50	9	\$5 50
Whites—Miners	167	\$3 50			167	3 50
Miners' Helpers						
Labourers	100	2 25	65	2 00	165	2 15
Mechanics and Skilled Labour			15	3 00	15	3 00
Boys	7	1 00	8	75	15	85
Japanese						
Chinese						
Indians						
Totals	274		97		371	

Name of Seams or Pits—No. 1 Tunnel, 3 seams, 5 feet 6 inches, 30 feet, 8 feet; seam working, 8-foot seam; No. 2 Tunnel, 6-foot seam.

Description of seams, tunnels, levels, shafts, &c., and number of same—No. 1 Tunnel, 8-foot seam, 1,000 feet driven in from surface; 12 working places, 12 and 16 feet wide; system of working, pillar and stall. No. 2 Tunnel, 6-foot seam; clean coal; 30 working places; system of working, pillar and stall. Ventilation, No. 1 Tunnel, 4-foot Murphy fan; No. 2 Tunnel, 8-foot Murphy fan.

Description and length of tramway, plant, &c.—Trestle connecting Nos. 1 and 2 Tunnels, 1,000 feet apart; No. 1 north side, No. 2 south side Coal Creek; Haulage, electric motors (2), trolley system; electric hoist; horse haulage; electric pump. Coal Creek Mines, 5 miles from the town of Fernie (east); town situated on main line of C. P. R.

JAS. JOHNSTONE.

The Minister of Mines is hereby authorised to publish these returns.

JAS. JOHNSTONE,
General Manager.

COAL MINES REGULATION ACT.

Returns for year ending December 31st, 1899, from Michel Colliery, South-East Kootenay District.

Operated by THE CROW'S NEST PASS COAL Co., LTD.; head office at Toronto, Ont.

Coal sold for consumption in Canada, 391 tons of 2,240 lbs.

Number of hands employed—Supervision and clerical assistance, 1; miners, 16, labourers, 13; total, 30.

Daily wages paid—Supervision and clerical assistance, \$5; miners, \$3; labourers, \$2.25

Name of Seams or Pits—Michel, 14-foot seam.

Description of seams, tunnels, levels, shafts, &c., and number of same—One tunnel 400 feet long, and one tunnel 350 feet long, being prospect tunnels.

Description and length of tramway, plant, &c.—One tramway 300 feet long, and one trestle 200 feet long, crossing Michel Creek, by which coal is delivered to railway cars. Horse haulage.

JAS. JOHNSTONE.

COAL MINES REGULATION ACT.

Returns for year ending December 31st, 1899, from Erickson Colliery, South-East Kootenay District.

Operated by THE CROW'S NEST PASS COAL Co., LTD.; head office at Toronto, Ont.

Coal sold for consumption in Canada, 123 tons of 2,240 lbs.

Number of hands employed, 4; daily wages paid, \$3.

Name of Seams or Pits—One 15-foot seam—Peters seam.

Description of seams, tunnels, levels, shafts, &c., and number of same—This mine is at present being opened out, and consists of two tunnels, 250 feet long each.

JAS. JOHNSTONE.

I am indebted to Mr. Robert Fisher, Superintendent of the Coal Creek Colliery, for the following description of the mine, plant and equipment :—

DESCRIPTION OF COAL CREEK COLLIERY.

The above-named collieries are owned and operated by the Crow's Nest Pass Coal Company, Limited, of which the Hon. Geo. A. Cox is President; Mr. Robert Jaffray, Vice-President and Managing Director; Mr. James Johnstone, General Manager; Mr. Robert Fisher, Superintendent of Mines (certificated); and Mr. F. B. Smith, Engineer.

The mines are situated in Coal Creek Valley, five miles east of Fernie, at an altitude of 3,800 feet above sea level, being connected by a branch railway five miles long with the C. P. R. main line at Fernie Junction. The location of the mines is 525 feet above Fernie Town-site, causing the average grade of the branch line to be about two per cent.

The general line of strike is approximately north and south, while the dip and rise of the measures varies from level to fully twenty degrees, rising toward the west. Consequently the surface outcrops of the several seams are exposed at a considerable height above the mines.

The mines, Nos. 1 and 2, are situated respectively on the north and south sides of the valley, about one thousand feet apart, but, although relatively on the same level, the tunnels are not working the same seams. In order to, as much as possible, concentrate the surface labour and requisite shipping plant, the tunnels are connected by a substantial trestle bridge, forty-five feet high above the creek, upon which, and equidistant from each mine entrance, are erected "Gurney's" scales for weighing the coal, Mitchell tippers for dumping mine cars, mechanically driven shaker screens for eliminating slack and sizing coal, travelling picking table for the separation of impurities, and loading arrangements to facilitate shipping into railway cars.

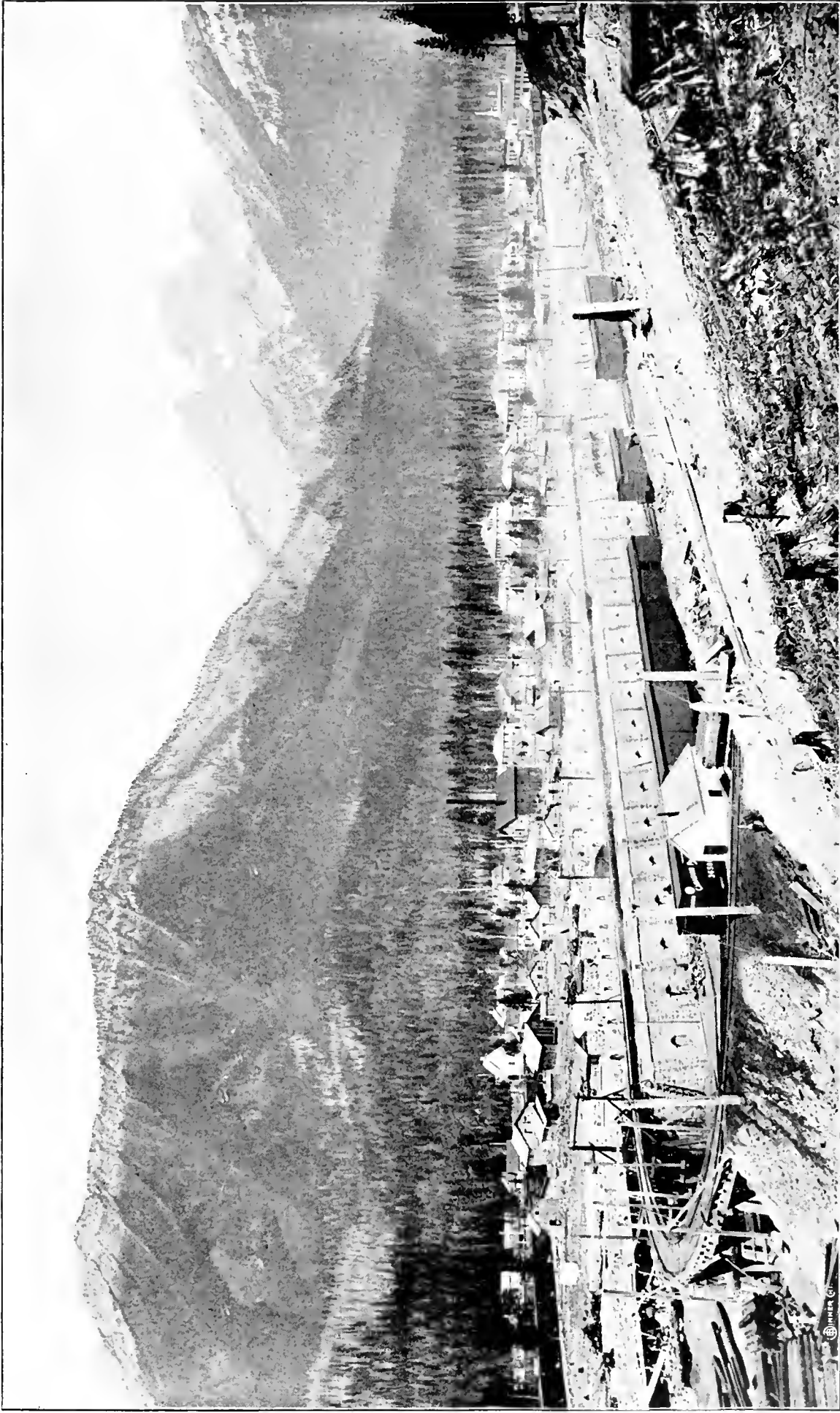
The production of coal for the year ending 31st December, 1899, exceeds 100,000 tons, a portion of which was shipped to the coke ovens at Fernie. The output of manufactured coke for the same period was about 30,000 tons. Both coal and coke have had a ready market, and there is an increasing demand. The distribution has been wide, embracing the Territories (east to Winnipeg), the United States and British Columbia, and large consignments have been delivered to the Royal Navy on the Pacific Station.

The output from the various seams is wholly of steam, smithing, domestic and coking descriptions. The several kinds of coal are much favoured by consumers, and it is great satisfaction to know that in all recent development in new seams the excellent quality has been maintained.

In consideration of the increasing demand for both coke and coal, the Company have under consideration the erection of additional coke ovens and the installation of extensive mine haulage machinery and other plant.

The estimated output of these mines for 1900 will exceed 200,000 tons of coal.

Coke Ovens. These are of the beehive shape, fully 200 in number and having a diameter of 12 feet. They are placed in two double rows with open tops. The average charge of slack coal is 6.5 tons (2,000 lbs.); production of coke per charge 4.42 tons; percentage in coke 68%; time of burning charge in hours, 60 to 72; average output for each oven per diem, 1.4 tons. No provision is made to recover the various by-products. The coke is cooled by watering inside the ovens, a process necessarily causing considerable loss of heat and also deterioration, through cooling, of the internal lining of the oven. But coke thus cooled previous to being drawn out of the oven, almost invariably contains less moisture; smelters and other consumers reap the benefit, but the Company is determined to spare no expense in its laudable endeavour to produce the best coke possible.



COKE OVENS AT FERNIE—FORT STEELE MINING DIVISION, EAST KOOTENAY.



During the greater portion of the year only 50 ovens were operated, but latterly another 70 were put to work. An additional 100 have been completed but have not yet been charged, and others are under way. The estimated cost of the 200 ovens completed exceeds \$180,000. Formerly the ovens were charged by an electrically driven (trolley system) lorry, having a capacity of 7 tons of coal slack. The track over the ovens is of standard gauge, 4 feet 8½ inches. The electric motor haulage has since been abandoned and the "lorry" is now being operated by steam locomotive.

The coking coal is stored in considerable quantity adjacent to the ovens. The mammoth bin has a capacity of 4,500 tons (cost \$20,000), and three-quarters of a million feet of lumber was used in its construction. Another holds 500 tons and both are self discharging.

SCREENS, CLEANING AND DUMPING PLANT.

The mines are equipped with the most modern screening, sizing and dry-cleaning machinery. There are two mechanically driven Shaker screens, one above the other. They are 20 feet long by 5 feet wide, and have a working speed of 100 strokes per minute by 6-inch stroke. The inclination of the Shaker is 17°, dipping toward the discharge. The upper screen deals with the "run of mine" coal, while the eliminated slack coal passes on to the under screen, which separates it into coking, smithing and domestic nut coal. The large coal is discharged by the top shaker upon a travelling picking table. The Shaker screens are fitted with interchangeable steel wire bottoms of various meshes, to size the coal for all markets.

The dry-cleaning plant consists of a travelling picking table, mechanically driven simultaneously with the screens. It is 60 feet long, 5 feet wide, and travels 40 feet per minute. The discharge of coal can be easily regulated by means of friction gear attached to the driving shaft. This table conveys the whole of the large coal from the screens to the railway cars. To prevent stones or other impurities being shipped amongst the coal, men and boys are stationed alongside the table to pick out all foreign matter.

DUMPING.

The loaded mine cars, containing about 3,000 lbs. of coal, after being weighed on the pit bank, are dumped by means of a "Mitchell tippler," which is capable of dumping ten tons a minute. It is so arranged that the following cars release the wheel grips of the empty car in front, which then runs forward down a 5% grade for a distance of 50 feet, then back switches on another track, falling 5%, for the same distance to the side of the tippler. Having reached this point by gravity power, the car is then pushed up a 15° incline to a sufficient height to permit it to again run forward into the empty track, ready for attaching to the motor trip. The whole of this plant, which is operated by an engine 11 inches diameter of cylinder by 12 inches stroke, and sprocket wheels, chains, etc., was manufactured and supplied by Mathesons & Co., Engineers, New Glasgow, Nova Scotia.

The mine coal cars have a net capacity of one ton, but, with a little top setting, hold on an average 3,000 lbs. of coal. The tare weight is 1,100 lbs. They are constructed of wood, 2 inches in thickness, and fitted with the usual iron mountings. Dimensions are:—Length, 5 feet; width, 4 feet; depth, 2 feet; length over trams, 6 feet 6 inches; steel wheels, 12 inches diameter (Hadfield's patent); axles, 1½ inches diameter; gauge of track, 3 feet; wheel centres, 1 foot 10 inches; total height above rail, 3 feet 3 inches. They are constructed with end dumping doors.

Cars of the same make and capacity are fitted as water sprinklers. A perforated pipe is fixed to both sides and end, and used for damping the coal dust on the haulage roadways.

HAULAGE.

The mine haulage might be referred to as being main and secondary. The former is operated for several thousand feet by an electric locomotive, the latter by means of electrically driven stationary hoist and horse haulage. The electric locomotive was built and supplied by the Jeffreys Manufacturing Co., Columbus, Ohio, U. S. A. The voltage is 220, and the amperage 400. The electrical horse-power equals 70, and is supplied and developed by two fixed motors, each of 35 horse-power, which are geared separately to 24-inch driving wheels, at the ratio of 1 in 5. The total weight of the locomotive is 20,000 lbs., and with broad-topped rails it has considerable traction force. This (trolley) system of electric haulage has been in operation for a year, and, having regard to the steep grades worked, has given entire satisfaction. During 24 hours (three shifts) one motor has hauled, on grades against load at from 2 to 4 %, fully 900 tons of coal. The average load per trip on the grades mentioned are as follows:—13 mine cars, net coal, 40,000 lbs.; 13 mine cars, net tare, 14,000 lbs.; total weight per trip, 54,000 lbs.

The following are the dimensions of the motor:—Length, 10 feet 6 inches; height, 3 feet 4 inches; width, 4 feet 7 inches; wheel centres, 3 feet 4 inches; gauge, 3 feet; driving wheels, 2 feet diameter; height under frame above rail, 4 inches. The weight of rail is 40 lbs. per yard, and the speed attained 8 miles an hour.

Owing to the undulating character of the coal field there are, even on the line of strike, some very steep grades, which it is practically impossible to overcome by means of horse haulage. The secondary haulage on these parts is, therefore, operated between the stalls and locomotor stations by means of an electrically driven stationary hoist. The 25-horse power motor was discarded and removed from the electric coal lorry in use at the coke ovens, and was fitted with the necessary shafting, pinions, friction gear and drum at the colliery shop. It is geared between the armature and drum speed at a ratio of 1 in 25, thus giving the drum a rope speed of two miles an hour. By this means the main level has been extended 600 feet on a 15 to 20 % grade against the load, where horse haulage was quite out of the question.

The electric motor operating the hoist was constructed by the Canadian General Electric Company. Although stationed 1,500 feet within the mine, and working 24 hours per day, it has so far given every satisfaction. Horses convey the coal cars from the stalls on the moderate grades to dispatching stations on the main levels. This haulage is both convenient and economical, especially so owing to the thickness of the seams permitting the necessary height without the breaking down of the roof. To enable horses to both pull and hold back on grades they are harnessed into shafts, which are attached by a shackle to the end of the coal car. This system serves the double purpose of pulling and holding down hill, and shafts are advantageous under such conditions.

COAL CUTTING MACHINERY.

There are two electrically driven coal cutting machines of the chain type; they were in use only for a short time, as owing to the excessive grades and their great weight (3,000 lbs.), it was with difficulty they could be removed from stall to stall. Further development will probably provide a more favourable section where they may be advantageously operated. There is a single motor of 220 volts and 400 amperes attached to each, developing about 25 horse-power. It is pinion geared to a horizontal sprocket chain wheel placed under the motor, which drives the cutter chain 250 feet a minute. The cutting picks are set into sockets, which form part of the chain, at the $7\frac{1}{2}$ -inch centres; they are $1\frac{5}{8}$ inches projected from the holders of which the top and bottom picks are in alternate positions. The picks are attached to the chain at an angle of 35° , and point up and down alternately. This arrangement of the cutters

provides the necessary clearance for the movement of the chain when undercutting the coal. The cut is 4 inches high. The machines are about 11 feet long, 2 feet 8 inches high by 3 feet wide at the motor end. The cutter end of the slide plate is 3 feet 6 inches wide, and can move forward about 6 feet, so that one cut of machine, 6 feet deep by 3 feet 6 inches wide, under cuts 21 square feet of coal. Under ordinary conditions the machines will make a full depth cut in 3 minutes. They are provided with portable reels and insulated cables to self propel themselves by sprocket chains attached to motor and carriage. The capacity, with good roof and level ground, is 100 tons a day.

METHOD OF WORKING.

The coal seams at present being worked are extracted principally on the "pillar and stall" system. The main levels and headings are driven 12 feet wide, suitable, if required, for a double track, and, as regards the ordinary working stalls, they usually average from 16 to 18 feet in width. The stalls are driven parallel, and are connected at intervals of 50 to 60 feet by cross-cuts at right angles. The cross-cuts short-circuit the fresh air current, improve the ventilation at the stall face, and otherwise dispense with temporary brattice cloth.

Pillars of solid coal are left in the first working to support the roof, and are arranged in blocks ranging from 10 to 15 yards square. The pillars are being rapidly increased in size as the workings extend to the south and north into the mountains, which here rise very precipitously to a height of fully 2,000 feet above the tunnels. It is desirable to have the pillars left as large and substantial as possible to enable them to withstand the enormous superincumbent pressure of over-head cover. Considering the accessibility of the seams, it is highly improbable that the pillars will be extracted until the "upper seams" are either exhausted, or are being developed simultaneously with the lower seams in the section.

The No. 2 Tunnel, on the south side of the valley, is working the upper portion of an 11-foot seam. The top, 6 feet to 6 feet 4 inches, is being extracted. The under part, constituting the floor or pavement, is alternating bands of coal and shale. This makes a splendid floor. The roof slate is very regular and of great strength, seldom requiring much extra timbering to secure it.

During the year nearly all development has been done toward the east or dip. A motor-haulage road has been driven 1,600 feet, south 39° east, from a point inside the gravel tunnel. The ground passed through is very undulating. There is not much water to deal with and all through the thickness an excellent quality of coal has been maintained. The pillars contain hundreds of thousands of tons of coal reserves. No faulting of the measures has been met with except rise throw to the west of water level. Operations are in progress to develop the coal located west of the troubled ground.

Towards the fault the inclination of the measures ranges from 16° to 20°. Arrangements will perhaps be made to equip this steep section with gravity haulage instead of horses. This could be operated satisfactorily by means of a brake-wheel and balance to run trips of cars or cars run upon carriages, collecting coal cars and giving empties at the entrance to the stalls, then lowering to the main haulage level.

In No. 1 Tunnel the lower 6-foot seam has been abandoned for the present and operations are being carried on in an 8½-foot seam of excellent quality. This seam is probably the top section of a 30-foot seam situated 42 feet above the original 6-foot seam. The seam was opened by means of a stone tunnel driven with a rise grade of 2% and cross-cutting the roof measures toward the dip. The thick seam was good next the floor, but was rather soft and mixed with shale and unsafe for a roof although booms and logging were used. The level was driven further through coal and stone, rising 8% into the 8½-foot seam.

The strike is very irregular as it dips 15 % in two places at right angles to each other.

The seam is being rapidly opened out also on the pillar and stall system. Levels and headings are driven fully 10 feet per diem. A level is being pushed southward with the object of making a new entrance, which will be 700 feet east of the present gravel tunnel. The roof slate rock is fairly good. A small quantity of water is found which is handled by hand pump. As regards explosives, only ordinary blasting powder is used with patent safety squibs.

VENTILATION.

Murphy's reversible fans are erected at both No. 1 and No. 2 Tunnels. They are most efficient ventilators and can be changed from forcing to exhausting in a few seconds. This arrangement is of especial value and is advantageous in changing the air currents should occasion arise. The No. 1 fan is 4 feet in diameter by 2 feet 2 inches wide, having a working speed of 300 revolutions a minute. It is driven by belting gear by a steam engine, cylinder 6 inches diameter by 8 inches stroke, speed, 150 revolutions. At present it works as exhausting fan, producing 13,000 cubic feet of air per minute.

Steam power is supplied by a 30 horse-power loco-tubular boiler. Working pressure, 50 lbs. per square inch.

No. 2. Tunnel is ventilated by a fan of 8 feet diameter by 5 feet wide. It is belt geared for a speed of 250 revolutions per minute, the ratio of engine and fan speed being 1 to 1.6. It is driven by a Ewart's horizontal engine, cylinder, 11 inches diameter, stroke 1 foot 2 inches. Amount of air produced, 70,000 cubic feet. Steam for this engine is supplied by the power-house boilers, 500 feet distant, which have a working pressure of 100 lbs. per square inch.

The fans, 30 h. p. boiler and Ewart's engine were supplied by Bullock Manufacturing Co., U. S. A.

The "splitting" system of ventilation is adopted. Large quantities of fresh air are circulated through the several sections of the mines, 300 to 500 cubic feet per minute being supplied to every man and horse working in the colliery.

Considerable quantities of light carburetted hydrogen gas (fire-damp), CH_4 , is given off, due, probably, to the fact of the coal field being still almost intact, to the enormous thickness in section, and the great depth of covering, viz. : 2,500 feet. The exposed outcrops must have drained it considerably, but the nature and composition of the coal seams might perhaps account for its presence in such quantities.

The altitude, about 4,000 feet, gives exceedingly low barometer readings of 24 to 25 inches, but, during atmospheric depressions, the pressure per square inch does not exceed 12 to $12\frac{1}{4}$ lbs. Under such conditions, safety lamps are in use occasionally, but the mines are usually worked with the open light.

Coal dust is another element of danger which has received careful attention. A thorough system of "watering" is carried out, with excellent results.

The main haulage roads are lighted by electric incandescent lamps, 16 candle power. Owing to the 220 volt pressure, pairs are attached in series. The current is supplied by trolley figure eight wire and bonded rail. In lighting the bridge, loading-shed, sidings, etc., arc-lamps of 1,000 candle power in multiple are in use.

ELECTRIC POWER PLANT.

The dynamo was made by the Eddy Electric Manufacturing Co., Windsor, Conn., U.S. A., for the Jeffreys Manufacturing Co., Columbus, Ohio, U. S. A., which supplied the plant. It

is driven by a Polson's horizontal engine, 16 by 16 inches, at a steam pressure of 100 lbs. per square inch. The dynamo is driven by a 12-inch belt; speed, 620 revolutions per minute. It is a direct-current constant potential dynamo, 134 horse-power, over-compounded 10 per cent. It supplies pressure on the line at about 220 volts. The capacity of the dynamo is 250 volts, or with no load, 400 amperes. The current is conducted into the mines by a figure eight copper wire (equal to 00 B. & S. gauge). It is suspended on standard mine hangers made by the Ohio Brass Company.

There are two Polson's loco-tubular boilers supplying steam at 100 lbs. per square inch to the following engines:—Dynamo engine; No. 2 fan engine; screens engine and machine shops engine. An Eddy dynamo of the same capacity is *en route* to increase the power. The Jeffreys are supplying another electric locomotive similar to the one in use.

PUMPING.

Considering the extent of the area developed below the drainage level, there is comparatively little water. The irregular nature of the ground prevents concentration to permit of pumping direct from one or more places. Several small hand-pumps (Sould's) are in use. The principal pump is a Tripley type, electrically driven, and supplied by the Jeffreys Manufacturing Co. It has a 3 horse-power motor, 220 volts, 400 amperes, and is geared direct to the crank shaft, at the ratio of 20 to 1. The cranks are set at 120°; diameter pump rams, 3 inches; length of stroke, 3½ inches, number of strokes, 60; capacity, 17 gallons of water per minute.

The buildings at the mines include thirteen semi-detached double-storey cottages, accommodating 26 families of employees. Five dollars a month rent is charged, but householders also have supplied them one ton of coal monthly, free of charge. The various offices connected with the colliery works are both commodious and substantially built, viz.:—Two fan and engine houses, smith shop, electric locomotive shed, carpenter's shop, warehouse, stables, feed sheds, colliery office, electric power house, miners' washing room, machine shops, and boiler shed.

TRAIN SERVICE.

The Colliery Company have at very considerable expense provided a free train service for employees travelling between the mines and Fernie. There are four trains dispatched both ways every day. The mine tools are supplied free of charge, and no deductions are made for smithing.

Miners are paid by contract rate per ton of "run of mine" coal.

The section and weight of rails in use are:—For electric locomotive track, 40 lbs. per yard; stall service, 18 to 25 lbs. per yard. The switches and crossings are made from F. B. rails at the colliery shops.

Payment of wages is monthly; previous to pay day a statement of moneys due and deductions are furnished to every employee.

There is about a mile of railway sidings in connection with the loading shutes, where four C. P. R. cars are loaded with different sizes of coal at the same time.

The number of men and boys employed is about 400.

The average wages earned by the miners is \$3 to \$3.50 per day; general mine labour, \$2 to \$2.75; general surface labour, \$1.75 to \$2.

 REPORT ON INSPECTION OF CROW'S NEST COLLIERIES.

BY JAS. MCGREGOR, INSPECTOR.

During the year I paid visits to the coal mines of the Crow's Nest Pass, and carefully looked them over. The mines at Coal Creek are worked with two tunnels. No. 2 Tunnel is 1,500 feet long, and operated on the pillar and stall system. The coal on the main tunnel is taken to the surface by electric train. I found the ventilation very good indeed, and on my last visit my anemometer registered 70,000 feet to the minute. No. 1 Tunnel is 1,000 feet long, but work has been stopped for the present, the management having decided to drive an incline to the seam above, forty feet vertically. The output is between 700 and 800 tons a day, and is continually increasing. Three hundred men are employed, and are taken by train to and from Fernie, five miles distant, at every shift. A large number of coke ovens are in operation at Fernie. The number will be increased as fast as possible, and the output will soon be doubled. The machinery is in the best order, and of the latest type. Special attention is being paid to the comfort and safety of the employees. The same Company is opening up large mines at Michel Creek, a short distance east of Fernie, where coal is in unlimited supply.

 REPORT ON THE INSPECTION OF VANCOUVER ISLAND COAL MINES.

FROM REPORT OF THOS. MORGAN, INSPECTOR OF VANCOUVER ISLAND COLLIERIES.

I have the honour to submit herewith my annual report on the coal mines of Vancouver Island for the year 1899.

The output of the Vancouver Island Collieries for the year 1899 amounted to *1,203,199 tons 15 cwt., an increase over that of 1898 of some 85,285 tons.

The excellent coal produced meets with a ready sale, both in the home and foreign markets, and the outlook for a continuation of a ready market seems good for years to come.

The following Companies have been operating collieries on Vancouver Island during the year, viz.:—NEW VANCOUVER COAL MINING AND LAND Co., LTD., operating the *Nanaimo Colliery*, consisting of the No. 1 Shaft Esplanade (in the City of Nanaimo), Protection Island Shaft, and No. 5 Shaft, Southfield (near Nanaimo River).

ROBERT DUNSMUIR & SONS, operating the *Wellington Colliery*, comprising No. 1 Shaft, near Departure Bay, and Nos. 3, 5 and 6 Shafts, at Wellington.

THE UNION COLLIERY Co., of B. C., LTD., operating the *Union Colliery*, consisting of No. 4 Slope, and Nos. 5 and 6 Shafts, in the Comox District :

Wellington Colliery, in Douglas District, known as the "Extension Mine," consisting of Nos. 1, 2 and 3 Slopes, and the Tunnel Mine :

The *Alexandria Colliery*, in the Cranberry District, at Union Bay. This Company also manufactures coke, as well as brick, both fire and ordinary.

The WEST VANCOUVER ISLAND COMMERCIAL Co. has been developing coal seams at Quatsino, on the West Coast of the Island.

*NOTE.—These figures are correct, according to the certified returns of the various collieries, but unfortunately Mr. Morgan sent in to this Department other and incorrect advance figures, giving the output of the V. I. Collieries as 1,191,008 tons—some 12,192 tons less—which figures were embodied in the statistical tables in the first part of this Report, and were printed before corrected figures were received; consequently these tables are subject to correction by the addition of 12,192 tons of coal, valued at \$36,576.

AGGREGATE SUMMARY OF RETURNS FROM VANCOUVER ISLAND COLLIERIES FOR YEAR 1899.

	Tons. (2,240 lbs.)	Cwt.	Tons. (2,240 lbs.)	Cwt.
Sold for consumption in Canada.....	264,883	3	1,016,594	3
" export to other Countries.....	751,711	—		
Total Sales.....				
Stocks on hand first of year.....	9,096	10		
" last of year.....	37,650	14		
Difference added to stock during year...			28,554	4
Used under Colliery boilers, &c.....			158,051	8
Output of Collieries for year 1899.....			1,203,199	15

NUMBER OF MEN EMPLOYED.

Character of Labour.	Number employed.		Total number employed.
	Underground.	Above ground.	
Whites—Miners.....	1,329	.....	1,329
Miners' Helpers.....	219	.....	219
Labourers.....	513	69	582
Mechanics and Skilled Labour.....	87	245	332
Boys.....	98	11	109
Japanese.....	16	36	52
Chinese.....	187	507	694
Indians.....	<i>None.</i>	<i>None.</i>	<i>None.</i>
Totals.....	2,499	868	3,317

According to the Act (section 53), publication of the detailed returns of a colliery can only be made with the consent of the owners thereof, and, as certain owners have refused such consent, I am unable to give a detailed account of the output, etc., of each mine from official returns, as has been possible in previous years, but must confine myself to an aggregate summary as above.

I have, however, compiled the following tables from the monthly statements as published in the press, the resultant total differing somewhat, as will be seen, from that of the preceding official table.

OUTPUT OF COAL, 1898 AND 1899.

	1898	1899
	Tons.	Tons.
The New Vancouver Coal Mining & Land Co., Ltd	520,222	614,808
R. Dunsmuir & Sons, Wellington Colliery	315,738	257,443
Union Colliery Co. of B. C., Ltd., Union Colliery	236,395	206,871
" " Alexandria Colliery	45,560	47,129
" " Extension Colliery .....	.....	40,000
Total	1,117,915	1,166,251

FOREIGN SHIPMENTS OF COAL, 1899.

	New Vancouver Coal Mining & Land Co., Ltd.	R. Dunsmuir & Sons.	Union Colliery Co. of B. C., Ltd.
	Tons.	Tons.	Tons.
January	33,183	11,420	5,172
February	29,049	15,180	9,397
March	43,557	17,150	11,208
April	44,925	12,218	6,225
May	47,021	26,024	4,119
June	36,323	14,620	10,395
July	37,748	14,054	6,420
August	39,370	12,970	6,857
September	41,753	21,870	2,826
October	37,575	19,960	5,170
November	36,448	22,933	8,256
December	36,157	18,023	14,646
Totals	463,109	206,422	88,174

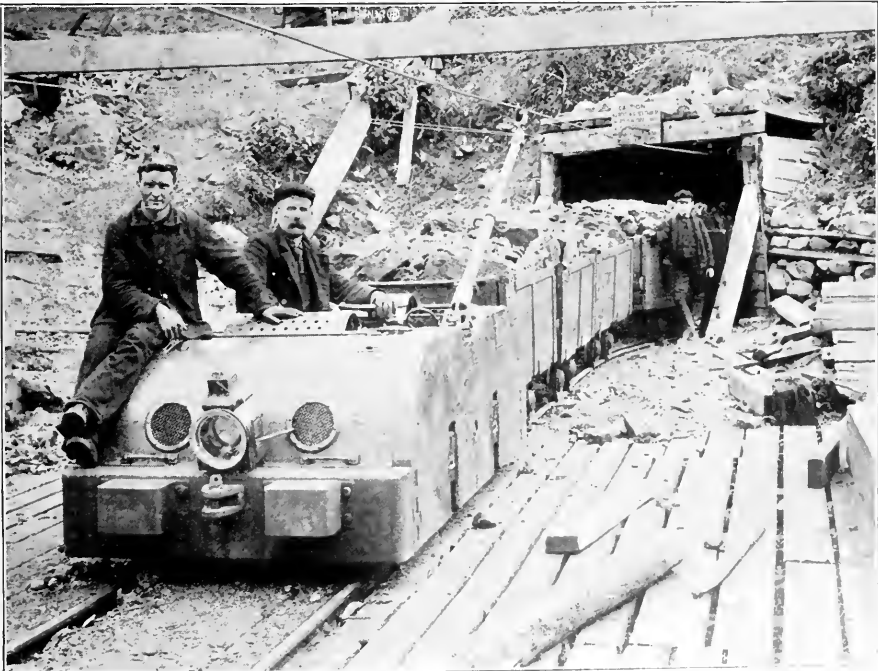
SUMMARY OF FOREIGN SHIPMENTS, 1898 AND 1899.

	1898	1899
	Tons.	Tons.
New Vancouver Coal Co	403,535	463,109
R. Dunsmuir & Sons	232,642	206,422
Union Colliery Co.—Union	129,684	88,174
" " Extension .....	.....	11,336
Totals	765,861	769,091

Under the heading "Used under Colliery Boilers, &c.," in the table giving aggregate summary of returns, is included the coal used in coke-making, as well as that burned in the colliery locomotives. The fuel burned in the colliery furnaces consists mostly of dross or fine coal.



ELECTRIC TROLLEY—CHARGING COKE OVENS—FERNIE.



TRIP OF MINE CARS—No. 1 TUNNEL—CROW'S NEST COLLEGE.



The principal foreign markets for Vancouver Island coal are San Francisco and southern ports of California, the Hawaiian Islands, and ports in Alaska. The China and Australian steamships are also large consumers of fuel.

The sources of supply of coal for the State of California, from 1896 to 1899, are shown in the following table:—

	1896	1897	1898	1899
	Tons.	Tons.	Tons.	Tons.
British Columbia	551,852	558,372	651,208	623,133
Australia	273,851	281,666	201,931	139,333
English and Welsh	156,368	107,969	75,115	93,263
Scotch	8,356	4,081	5,056	<i>None.</i>
Eastern Cumberland and Anthracite	17,907	21,335	37,560	38,951
Seattle, Washington	128,919	220,175	283,963	271,694
Tacoma, "	255,923	286,205	348,474	355,756
Mount Diablo, Coos Bay, and Tesla	110,237	115,150	172,506	189,507
Japan and Rocky Mountain (by rail)	2,247	6,587	26,560	28,390
Totals	1,505,660	1,601,540	1,802,373	1,740,027

The proportion of the above coal that was delivered in 1899 by water at the southern ports of California, viz., Los Angeles and San Diego, amounted to 184,747 tons, largely derived from British Columbia.

Coke. During the past year, the coke ovens at Union only turned out 5,000 tons of coke, which was sold on the Coast and in San Francisco, where it met with a favourable reception. The Kootenay coke market being so much nearer Crow's Nest will, of course, be supplied by that colliery, so that Vancouver Island coke will have to find a market elsewhere. The coke imported into California in 1899 amounted to 31,091 tons, and, as the ovens at Union are to be run to their full capacity, a large proportion of this trade may, in 1900, be expected for British Columbia.

NANAIMO COLLIERY.

The following are the Official Returns from this Colliery for the year 1899 :—

COAL MINES REGULATION ACT.

Returns for the year ending December 31st, 1899, from Nanaimo Colliery.

Operated by New Vancouver Coal Mining & Land Co., Ltd. ; head office at London, England.

OFFICERS.

ADDRESS.

J. Galsworthy, Chairman. 12 Old Jewry Chambers, Old Jewry, E.C. London.
Joseph Ramsden, Secretary, " " " "
Samuel M. Robins, Superintendent, Nanaimo, B.C.

Share capital of Company, \$1,075,000 ; debenture capital, \$250,000 ;
Value of Plant, \$350,000.

SALES AND OUTPUT FOR YEAR.	COAL.				COKE.			
	(Tons of 2,240 lbs.)				Tons.	cwt.	Tons.	cwt.
Sold for consumption in Canada	58,764	12						
" export to U. S	447,464	—						
" " to other Countries.....	15,397	—						
Total Sales.....			521,625	12				
Used in making Coke								
" under Colliery Boilers, &c.....	90,579	8						
Total for Colliery Use....			90,579	8				
Stocks on hand first of year	6,850	10						
" last of year	9,418	14						
Difference added to Stock during year .			2,568	4				
Output of Colliery for year .			614,773	4				

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, &c.

CHARACTER OF LABOUR.	UNDERGROUND.		ABOVE GROUND.		TOTALS.	
	No. Em- ployed.	Average Daily Wage.	No. Em- ployed.	Average Daily Wage.	No. Em- ployed.	Average Daily Wage.
Supervision and Clerical Assistance	13		15		28	
Whites—Miners	530	\$3 to \$4.50			530	
Miners' Helpers.....						
Labourers	385	\$2.50 to \$3	36	\$2.50	421	
Mechanics and Skilled Labour ...			81	\$3 to \$4	81	
Boys	60	\$1 to \$2	8	\$1 to \$1.50	68	
Japanese						
Chinese			189	\$1.12½ to	189	
Indians				[\$1.25		
Totals.....	988		329		1,317	

Names of Seams or Pits—Southfield No. 2, Southfield No. 5, No. 1 Esplanade Shaft, No. 1 Northfield Shaft, Protection Island Shaft.

Description of seams, tunnels, levels, shafts, &c., and number of same—Southfield No. 2, worked by slope, seam 6 to 10 feet; Southfield No. 5, worked by shaft, seam 5 to 10 feet; No. 1 Northfield Shaft, worked by shaft, seam 2 feet to 3 feet 6 inches; Protection Island Shaft, worked by shaft, lower seam 4 feet, upper seam 6 feet; No. 1 Esplanade shaft, worked by shaft, seam 5 to 12 feet.

Description and length of tramway, plant, &c.—Railway to Southfield, 6 miles, with sidings; railway to No. 1 Shaft, 1 mile, with sidings; railway from Northfield Mine to wharf at Departure Bay, $4\frac{1}{2}$ miles; rails are of steel, 56 lbs. per yard of standard gauge, viz., 4 feet $8\frac{1}{2}$ inches; 10 hauling and pumping engines, 20 steam pumps, 6 locomotives, 267 coal cars (6 tons), besides lumber and ballast cars; bunkers with capacity of 10,000 tons; fitting shops for machinery repairs, with turning lathes, boring, drilling, planing, screw-cutting machines, hydraulic press, steam hammer, &c., &c.; diamond boring machinery for exploratory work (bores to 4,000 feet); 150 h. p. electric plant, engines, boilers, dynamo; four 30 h. p. 8-ton locomotives and one 15 h. p. locomotive; hauling and lighting equipment; wharves 2,000 feet frontage, at which vessels of the largest tonnage can load at all stages of the tide.

NEW VANCOUVER COAL MINING & LAND CO, LIMITED,
SAMUEL M. ROBINS, *Superintendent*.

The Minister of Mines is hereby authorised to publish these returns.

NEW VANCOUVER COAL MINING & LAND CO., LIMITED,
SAMUEL M. ROBINS, *Superintendent*.

The Company has been working the following collieries during the year 1899 :—

No. 1 Shaft, Esplanade, Joseph Randall, Overman.

Protection Island Shaft, Thomas Mills, Overman.

No. 5 Shaft, Southfield, Richard Gibson, Overman.

The Northfield mine has stood idle all the year.

A detailed description of all these workings was published in the Report of last year and as no important changes have been made since then it is not considered necessary to here repeat such descriptions.

NEWCASTLE ISLAND SHAFT.

On the north-east side of Newcastle Island on the shore of the Straits of Georgia, a shaft has been sunk by the New Vancouver Coal Company, which reached the upper seam at 324 feet, where good coal was found. The shaft was deepened to the lower seam, 384 feet, and 10 feet further for a sump, making a total depth of 394 feet. The shaft is well timbered and safely constructed. By means of this shaft an extensive area of coal can be worked and it will also be used for the ventilation of the inside part of the workings of No 1 Shaft.

PROSPECTING BY DIAMOND DRILL.

During the past year considerable prospecting has been done on various parts of the Company's estate, by means of the diamond drill, with satisfactory results. Ten bore holes have been sunk.

 WELLINGTON COLLIERY.

Operated by R. Dunsmuir & Sons; Andrew Bryden, Manager. Head Office, Victoria, B. C.

The detailed Returns from this colliery have had to be omitted, in accordance with section 53 of the "Coal Mines Regulation Act," as the owners have refused permission to publish same.

The principal mines of this old established colliery are situated about 6 miles to the north-west of Nanaimo, and 3 miles from Departure Bay, which Bay is connected with Nanaimo Harbour by Exit Passage, both being under the same Customs and Harbour authorities.

 No. 1 SHAFT.

William Bailey, Overman.

This mine is entered by a shaft 300 feet deep, and is situated about a mile westerly from Departure Bay. Mining was stopped in April, but the shaft is used for pumping to aid in keeping the water down in No. 5 Shaft. No accidents were reported.

 No. 3 SHAFT.

James Sharp, Overman.

This shaft was shut down, the workings of the mine having been finished in July. Only three slight accidents happened in the mine, to three men, from gas in pot-holes in their working places, where the roof came down while they were extracting pillars. There was no blame attached to the management in these cases.

 No. 5 SHAFT.

David Wilson, Assistant Mine Manager.

This shaft, which has been an important mine in its time, and a large producer of the Wellington coal is, I regret to say, gradually drawing towards its end. The workings during the year have been in the withdrawing of pillars of coal. In the north-west level 20 men and 3 mules were working on a shift, to whom 11,200 cubic feet of air were supplied per minute. In the side slope 18 men were employed per shift, for whose use there was a current of 20,000 cubic feet of air per minute. In the east side there were 7 men per shift working, for whom there were 12,000 cubic feet of air passing per minute. On the west side 45 men and 4 mules per shift were working, for whose use 35,200 cubic feet of air per minute passed through the workings.

The shaft is down 265 feet and is worked by a slope, levels and inclines. The seam is from 5 to 10 feet thick. The motive power of the ventilation is by a Guibal fan, making 100 revolutions per minute with 1 $\frac{1}{4}$ -inch water gauge, which draws up the upcast shaft 106,560 cubic feet of air per minute. After deducting the air supplies as above for the workmen, there are 28,160 cubic feet for leakage through doors and stoppings, which goes through the old workings.

 No. 6 SHAFT.

James Sharp, Overman.

This mine was finished shortly after my last inspection in January, 1899.

Somewhat more detailed descriptions of the various properties will be found in the Report of the Department for 1898.

 UNION COLLIERY.

Operated by the Union Colliery Company; head office, Victoria, B. C. Jas. Dunsmuir, President; Jno. Bryden, Vice-President; C. E. Pooley, Secretary, all of Victoria; Alex. Dunsmuir, Treasurer, San Francisco; Francis D. Little, General Manager; and John Matthews, Mine Manager, Union.

Returns. The detailed returns from this colliery have had to be omitted, in accordance with section 53 of the "Coal Mines Regulation Act," as the owners have refused permission to publish same.

The shipping wharves of this colliery are located at Union Bay, Baynes Sound, on the East Coast of Vancouver Island, where are also situated a well-equipped Luhrig coal-washer, a coking plant consisting of two batteries, each of 100 bee-hive ovens, and large and suitable coal bunkers. The mines being operated are situated at the town of Union, about 11 miles north-west of Union Bay, connection between the two points being maintained by means of the standard gauge railway, built, owned and operated by the Company.

The Company has operated at Union the following mines:—

No. 4 Slope—Richard Short, overman.

No. 5 Shaft—David Walker, overman.

No. 6 SHAFT.

This is a new shaft which was "bottomed" in October last, at a depth of 814 feet. It is well constructed and timbered, with a mid-wall, and is now in full working order. The pit bottom is all timbered with 12 by 18 sawn bulks, built solidly together, 16 feet wide and 12 feet high. The hoisting plant consists of a 16 by 36-inch engine, provided with suitable and sufficient boiler service. The shaft is located close to the railway, and all necessary sidings have been provided. The seam struck is 7 feet thick. A level has been driven from the bottom some 80 yards, and headings have been started from both sides to make connection with the heading which is being driven from No. 5 Shaft.

In December last there were at work in this level some 14 men and one mule per shift, for whose use some 10,800 cubic feet of air was supplied. The ventilation is at present produced by a steam jet located at the bottom of the upcast division of the shaft.

No accident was reported during the sinking of this shaft.

In addition to the collieries and works at Union, this Company is also operating the *Alexandria Mine*, in the Cranberry District, and the *Extension Mine*, in the Douglas District. Fuller descriptions of the works and plant of this Company were given in the Report for 1898, and need not be here repeated.

At Union Bay 100 bee-hive coke ovens are in active operation, and 100 more are in process of construction. The coal for coke-making is washed in a Luhrig washer, and each oven is charged with 5 tons of washed screenings, the yield of coke being about 60 per cent., and of good quality.

Brick. The Company also manufactures both fire and building brick, for which a ready market is found. The fire clay used is taken from the collieries at Union, and the ordinary clay from a bed near the same place. The moulded bricks are dried in a two-storey building 30 by 80 feet, under the floors of which run flues, which distribute the heat from a furnace at the end of the building. The two kilns have a capacity of 40,000 bricks each.

ACCIDENTS OCCURRING IN BRITISH COLUMBIA COLLIERIES DURING 1899.

CAUSE OF ACCIDENT AND NATURE OF INJURY.	COLLIERY AT WHICH ACCIDENT OCCURRED.															TOTALS FOR YEAR IN ALL B. C. COLLIERIES.						
	Nanai-mo.			Well-ington.			Union.			Exten-sion.			Alex-andria.			Crow's Nest.			Total.	Fatal.	Serious.	Slight.
	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.	Fatal.	Serious.	Slight.				
Explosion of Gas																			30			
Fatal						3														3		
Serious							7		2											9		
Slight					4			9		2								3			18	
Fall of Coal																			8			
Fatal							1													1		
Serious					2			1		1										4		
Slight						2			1													3
Fall of Rock																			12			
Fatal	3																			3		
Serious		5																			5	
Slight									3									1				4
From Mine Cars																			16			
Fatal					1			1		1										3		
Serious						2			5		1			1							9	
Slight										3								1				4
From Mine Mules																						
Fatal																						
Serious																						
Slight																						
Powder in Mine																			3			
Fatal																						
Serious		1													1						2	
Slight						1																1
Railway on Surface																			1			
Fatal										1										1		
Serious																						
Slight																						
	3	6		1	4	7	5	13	16	2	4	2		2				5	70	11	29	30

DETAILED STATEMENT OF ACCIDENTS OCCURRING IN B. C. COLLIERIES DURING 1899.

REPORTED BY THOS. MORGAN, INSPECTOR V. I. COLLIERIES.

No.	Colliery.	Date.	Name.	Occupation.	Remarks.
1	Wellington ...	Jan. 19th	H. Clark.....	Miner	Slightly burned on face and one hand by gas.
2	Union	" 26th	Jap No. 12....	Taking up rails	Slightly burned in No. 9 Level, east of Diagonal Slope, No. 4 Slope.
3	"	" 26th	Jap No. 26....	" "	Severely burned in No. 9 Level, east of Diagonal Slope, No. 4 Slope.
4	"	" 26th	Jap (no No.)...	Pusher	Leg cut slightly in No. 11 Level.
5	"	Feb. 2nd	L. Richardson.	Miner	Two ribs broken by being caught between a post and a car while walking down his stall in No. 4 Slope.
6	"	" 2nd	Thos. Glover..	Miner	Back hurt slightly by a fall of rock in No. 4 Slope.
7	Wellington ...	" 2nd	Findley McRae	Mule driver...	Collar bone broken and bruised about the body by cars jumping the track and knocking out a prop, causing a fall of rock in No. 5 Pit.
8	Alexandria....	" 15th	S. Polombo ...	Pusher	Severe contusion of the upper arm from a car.
9	Nanaimo.....	" 22nd	W. L. Williams	Miner	Severely burned about face and arms by an explosion of powder. While he was emptying it from one tin into another, a spark from his lamp caused the explosion.
10	Wellington ...	" 22nd	Fred. Shear...	Miner	Squeezed between a box and a stringer, while riding a trip in No. 3 Shaft.
11	Extension.....	" 28th	John James...	"	Face and neck slightly burned by gas in East Level Crosscut in No. 2 Slope.
12	Wellington ...	March 3rd	John Rooney..	"	Foot bruised by a piece of coal falling upon it in No. 5 Pit.
13	Union	" 11th	A. Rouselle ...	"	Burned by gas, not dangerously, in his stall in No. 4 Slope.
14	Nanaimo.....	" 11th	J. W. Freeman	"	Severely injured about the hip by a fall of rock, while working at removal of pillars in No. 1 Shaft.
15	Union	" 14th	Ben. Scandit ..	"	Ankle crushed by a fall of top coal, in his stall in No. 4 Slope.
16	"	" 17th	O. Yama (Jap)	Pusher	Lower part of spinal column broken, by being jammed between a water box and the roof, while riding on the box in No. 5 Shaft.
17	"	" 25th	Chas. Crawford	Rope rider....	Leg slightly hurt by empty mine cars in No. 4 Slope.
18	Extension.....	April 17th	Leopold Prieux	Miner	Leg broken by a fall of top coal while working in his place in No. 2 Slope.
19	Nanaimo ...	May 3rd	Jas. Dunbar...	Mule driver...	Leg broken by a fall of rock in No. 1 Level, East Slope, Protection Island Shaft.

DETAILED STATEMENT OF ACCIDENTS OCCURRING IN B. C. COLLIERIES DURING 1899.—*Continued.*

No.	Colliery.	Date.	Name.	Occupation.	Remarks.
20	Wellington ...	May 4th	J. Beauchamp.	Pusher	Arm broken by being jammed between a car and a stringer in No. 5 Pit.
21	" ...	" 11th	Jas. Gourley ..	Miner	Chest injured. He was barring down coal, which caught the crow-bar and it struck him on the chest, in No. 5 Pit.
22	" ...	June 5th	Jas. Lucas	Rope rider....	Fatally injured by being squeezed between a car and a cap-piece in No. 5 Pit.
23	" ...	" 22nd	John Glodick ..	Miner.....	Slightly burned about the hands by gas, which had accumulated in their place in No. 3 Pit.
24	" ...	" 22nd	Mike Pillet ...	"	
25	" ...	" 24th	Wm. Coleman.	"	Arm broken by a fall of coal, while working in his place in No. 5 Pit.
26	Union	July 22nd	Jas. Fairburn..	"	Leg broken by being caught in a coil of rope while lowering a mine car down his stall in No. 4 Slope.
27	Wellington ...	" 29th	John Morris ..	"	Burned on arms, neck and back, by the ignition of powder while firing a shot in No. 5 Pit.
28	Nanaimo	August 7th	Ben. Greenway	"	Killed by a fall of rock from the roof, at his working place, while removing pillars in No. 5 Shaft.
29	Union	" 15th	Ed. Swanson ..	"	Squeezed by a fall of rock, while preparing to put up stringer in level, No. 5 Shaft.
30	Wellington ...	" 18th	G. Hermanson.	"	Head, back and elbow injured by a fall of coal while working in his place in No. 5 Pit.
31	Union	" 24th	Mah Sen.....	"	Killed by a fall of top coal in his stall, No. 13 Level in No. 4 Slope.
32	Nanaimo	" 25th	John Ross	"	Leg broken by a fall of rock and coal, while working in his place in Protection Island Shaft.
33	Union	" 30th	S. Torrance ...	Mule driver...	Fatally injured by mine car in No. 5 Shaft.
34	"	" 31st	Ed. Yarwood ..	Miner	Injured by a fall of coal in his stall in No. 4 Slope.
35	"	" 31st	John Cassassa.	"	Leg injured by a fall of coal in his stall in No. 4 slope.
36	"	Sept. 26th	Jas. On	Mule driver...	Leg broken by jumping off a car in No. 5 Shaft.
37	Nanaimo	" 28th	Geo. Vipond ..	Miner	Leg broken below the knee and face bruised by a fall of rock, while in his stall in Protection Mine.
38	Union	Oct. 4th	Hector McLean	"	Slightly injured by a fall of roof in No. 5 Shaft.
39	"	Oct. 11th	A. McKinnon .	Miner	Burned by igniting a feeder of gas which came from a break in the roof, in their working place, longwall in No. 4 Slope.
40	"	" "	Chinaman.....	Helper	
41	"	" "	"	"	

DETAILED STATEMENT OF ACCIDENTS OCCURRING IN B. C. COLLIERIES DURING 1899.—*Concluded.*

No.	Colliery.	Date.	Name.	Occupation.	Remarks.
42	Nanaimo	Oct. 11th	D. McNiven...	Miner	Killed by a post knocked out of place by a fall of roof in No. 1 Shaft.
43	"	" 13th	Nic. Milburn..	"	Killed by a fall of roof and coal while mining in his stall in Protection Island Shaft.
44	Extension	Nov. 11th	Loo Yung	Labourer	Killed by a locomotive, on the railroad at the chutes, No. 3 Slope.
45	Union	" 15th	Vic. Morinella.	Miner	Burned by gas flowing from a break in the roof, in their stalls in No. 13 Level, east side of diagonal slope, long wall in No. 4 Slope.
46	"	" "	John Comb . . .	"	
47	"	" "	John Mannel..	"	
48	Extension	" 20th	Geo. Horth . . .	"	Burned by gas in the heading off the tunnel. They went in with naked lights, after having been warned and provided with safety lamps.
49	"	" "	Thos. Belton ..	"	
50	"	" 21st	Chuck Wing ..	Rope rider	Killed by being struck by a coal car against a prop in No. 1 Slope.
51	Union	Dec. 5th	John Davis . . .	"	Arm broken by a trip of cars jumping the track at the switch in No. 4 Slope.
52	"	" 11th	Thos. B. Jones	Miner	Killed by an explosion of gas from an outburst from the roof in long wall working places in No. 4 Slope.
53	"	" "	Bernard Zucca	"	
54	"	" "	Chinaman	"	Fatally injured by above explosion; died on 15th December.
55	"	" "	H. Thompson..	Miner	Burned by the above explosion of gas in No. 4 Slope. H. Thompson and F. Larson not seriously injured.
56	"	" "	J. Guthro, Sr..	"	
57	"	" "	J. Guthro, Jr..	Helper	
58	"	" "	H. Fairburn ..	Miner	
59	"	" "	Fred. Larson..	"	
60	"	" "	Howado (Jap)..	Helper	
61	"	" "	Midao "	"	
62	Nanaimo	" 13th	Sam. McCourt.	Miner	Leg broken by a fall of coal and rock, while working in his stall in No. 1 North Level, off diagonal slope, No. 1 Shaft.
63	Extension	" 18th	Geo. Wilson ..	Trackman	Slightly burned by gas about the hands and face. He went into a place where there was a little gas, which he knew to be there, in No. 3 Slope.
64	Alexandria	" 22nd	Harry James..	Miner	Injured by a shot, which went off before he had time to get to a safe place, through the squib being cut too short.
65	Extension	" 30th	Ernest Chemley	"	Leg broken by being struck by the rope flying off the rollers on No. 3 Slope, when he was going to work.

REPORTED BY JAS. MCGREGOR, INSPECTOR.

1	Crow's Nest . . .	Feb. 1st	John McAdams	Miner	Slightly burned about the arms and neck by explosion of gas in No. 2 Tunnel.
2	"	July 13th	Dougald Adams	"	Slightly burned about arms and face by explosion of gas in No. 1 Mine.
3	"	Nov. 8th	K. McDonald..	"	Slightly burned by explosion of gas in No. 2 Mine.
4	"	Dec. 14th	John Powell ..	"	Slightly bruised on back and shoulders by fall of rock in the thick seam of No. 1 Mine.
5	"	" 7th	Andrew Bains.	"	Arm fractured in No. 2 Mine by car leaving track.

LIST OF CROWN-GRANTED MINERAL CLAIMS.

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NOTE.—A list of the Mineral Claims Crown-granted up to December 31st, 1896, will be found in the Report of this Department for 1896, while the lists of those issued in 1897 and 1898 will be found in the Reports for those years.

CROWN GRANTS ISSUED IN 1899.

EAST KOOTENAY.

Name of Claim.	District.	Name of Grantee.	Acres.	Description.	Date of Grant.
Beaver Fraction . . .	Fort Steele..	Geo. E. Foster <i>et al</i>	34.20	Lot 3073, G.1	1st June, 1899
Belcher	" ..	Hastings (B.C.) Explor. Synd., Ld	30.74	" 3041 "	2nd " "
Blucher	" ..	" "	45.90	" 3038 "	2nd " "
Coronado	Fort Steele..	Alex. Robson <i>et al</i>	51.65	" 3535 "	15th May, "
Clipper	Golden	John W. Conner	51.65	" 1113 "	9th June, "
Cariboo Marsh	Fort Steele..	The Alberta & Koot. Dev. Co., Limited Liability	39.20	" 3046 "	26th July, "
Canal	Windermere.	David Smith <i>et al</i>	51.65	" 3907 "	12th Aug., "
Copper King	Fort Steele..	Jacob Fink	51.65	" 3915 "	8th Nov. "
Copper Queen	" ..	"	40.48	" 3916 "	8th " "
Empire	Fort Steele..	Wm. S. Morris <i>et al</i>	26.40	" 3540 "	1st June, "
Foster	Fort Steele..	G. E. Foster and C. H. Keep	39.50	" 3539 "	2nd " "
First Extension Last Chance	" ..	" "	20.20	" 3071 "	1st " "
Last Chance	Fort Steele..	G. E. Foster and C. H. Keep	19.49	" 3070 "	1st " "
Midget Fraction . . .	Fort Steele..	Fred John Smith	17.89	" 3033 "	23rd " "
Old Baldy	Fort Steele..	Hastings (B.C.) Explor. Synd., Ld	50.84	" 3042 "	2nd " "
Quantrell	Fort Steele..	Fred John Smith	36.68	" 1383 "	23rd " "
Richmond Hill	Fort Steele..	G. E. Foster and C. H. Keep	46.10	" 3072 "	1st " "
Stonewall Jackson . .	Fort Steele..	Fred John Smith	51.65	" 3032 "	23rd Jan., "
Stemwinder	" ..	D. D. Mann and Wm. McKenzie.	41.80	" 2998 "	8th June, "
Silver Chief	" ..	David Griffith	20.66	" 3548 "	2nd Aug., "
Sirdar	" ..	"	45.20	" 3554 "	2nd " "
Swansea	Windermere.	W. B. Abel <i>et al</i>	51.65	" 2576 "	7th Feb., "
Utopia No. 2 Frac'n	Windermere.	Fred John Smith	18.35	" 3034 "	23rd Jan., "

WEST KOOTENAY.

Annie Fraction	Trail	British America Corporation, Ld.	2.38	Lot 3198, G.1	16th Jan., 1899
Alligash	Slocan	B. C. Gold Trust, Ltd.	32.18	" 2517 "	3rd Feb., "
Arlington No. 2	Slocan City . .	The Arlington Consol. Mg. and Smelting Co. (For.)	51.65	" 2416 "	3rd " "
Alki Fraction	Trail	Alki G. M. Co., Ltd	6.00	" 2851 "	23rd June, "
A. Y	Nelson	Henry Giegerick	34.54	" 2272 "	28th April, "
Arsenic	Revelstoke..	Carnes Ck. Consol. G. Mines, Ltd.	39.55	" 3358 "	19th May, "
Alexandra No. 2 . . .	Slocan	Daniel K. McDonald	51.65	" 2886 "	15th " "

WEST KOOTENAY.—Continued.

Name of Claim.	District.	Name of Grantee.	Acres.	Description.	Date of Grant.
American Boy	Slocan	Eva Boss, J. W. Troup and T. McGuigan	19.89	Lot 571, G.1	23rd May, 1899
Albion	Ainsworth	Albion Mg. Co.	17.50	" 3340 "	12th June, "
Aaron's Isle	Trail	Nils Pearson and Wm. Gibson	31.89	" 2955 "	15th " "
Aaron's Gem	"	" "	45.02	" 2956 "	15th " "
Aaron's Star	"	" "	45.13	" 2957 "	15th " "
Aaron's Fraction	"	" "	7.06	" 2958 "	15th " "
April Fool No. 2	"	M. Sicker and B. C. Dev. Co., Ld.	44.80	" 3845 "	22nd Aug., "
Alps	Slocan	Golden Canyon G. & S. M. Co., L.L.	51.65	" 1923 "	13th Sept., "
Alturus	"	" "	26.12	" 1924 "	13th " "
Alps Fraction	"	" "	18.01	" 1925 "	13th " "
Admiral Nelson	"	Wm. Clyman Yawkey	39.62	" 3106 "	20th Oct., "
Arlington	Nelson	Hastings (B.C.) Ex. S., Ld. (For.)	41.30	" 3648 "	17th Nov., "
Arlington Fraction	"	" "	10.94	" 3649 "	17th " "
Bondholder	Slocan City	A. M. Johnson	46.87	" 1257 "	28th April, "
Black Bull	Trail Creek	Jas. Davidson and Alex. Dunlop	25.00	" 3081 "	15th May, "
Big Bump	Nelson	Big Bump G. M. Co.	44.63	" 2464 "	11th Feb., "
Belt	Slocan	Argo Mines of Sandon	51.65	" 2139 "	21st March, "
Blue-Eyed Nellie	Nelson	Blue-Eyed Nellie M. Co., Ld. Ly.	22.84	" 2936 "	21st " "
Banwell Fraction	Trout Lake	C. E. Woods	31.50	" 1974 "	18th " "
Black Bear Fraction	Arrow Lake	Silver Queen M. Co., Ld. Ly.	1.37	" 2582 "	21st Nov., "
Black Bear	"	" "	47.08	" 2208 "	31st May, "
Black Fox Fraction	"	" "	1.77	" 2207 "	31st " "
Black Fox	"	" "	43.31	" 2206 "	31st " "
Ben	Slocan	Wakefield Mines, Ltd	29.52	" 2605 "	19th April, "
Barbara	Trail	W. H. Corbould	22.44	" 2387 "	19th " "
Blue Belle	Nelson	John Dean	51.65	" 3843 "	25th " "
Bald Eagle	Ainsworth	G. S. Anderson & P. O. Erickson	43.60	" 2649 "	1st June, "
Baltimore Fraction	Slocan	N.W. M. Synd., C. S. Rashdall, C. Stewart, Ed. Pitt	50.53	" 3522 "	21st April, "
Burlington No. 2	Slocan City	Arlington Consol. M. & S. Co.	51.65	" 2417 "	2nd June, "
Bessie A.	Ainsworth	W. F. Strobeck <i>et al</i>	48.00	" 2324 "	3rd " "
Bryan	Trail	Wm. deV. LeMaistre	30.68	" 1699 "	7th " "
Bannock	"	The B. C. M. Co., Ltd. (For.)	31.46	" 3295 "	8th " "
Bully Boy	Nelson	Alex. Goyette <i>et al</i>	32.38	" 3238 "	22nd Aug., "
Berlin	"	The Hall Mines, Ltd	24.37	" 3251 "	7th Sept., "
Britannia	"	" "	16.51	" 3253 "	7th " "
Bean Pot	Trail	Martin Warner	39.93	" 3233 "	7th " "
Black Diamond	"	Charles O. Wickenden	23.57	" 3125 "	7th " "
Berne	Nelson	Chas. Faas <i>et al</i>	29.65	" 2881 "	14th " "
Big Red Horse	"	F. E. White, Admin. of estate of Ralph White, deceased	50.28	" 2986 "	28th " "
Blue Jay	Revelstoke	Lillooet, Fraser River and Cariboo G. F., Ltd.	28.47	" 2779 "	6th Mch., "
Breslau	Ainsworth	Elkhorn S. M. Co., Ltd.	20.40	" 2430 "	16th " "
Blizzard	Nelson	W. L. Houser <i>et al</i>	45.61	" 3142 "	21st Jan., "
Beaver No. 2	Trail	Harrison Corey	39.58	" 3974 "	30th Oct., "
Boatswain Fraction	Slocan	N. W. Mining Syndicate, Ltd.	40.60	" 3112 "	24th Nov., "
Black Knight	Ainsworth	James Melley <i>et al</i>	47.61	" 2609 "	13th Oct., "
Black Bear	"	" "	22.09	" 2610 "	14th " "
Barnett	Slocan City	J. F. McRae	39.33	" 2888 "	3rd Nov., "
Big Four	Trail Creek	R. H. Smith, R. W. Northey	49.55	" 3716 "	16th " "
Black Eagle	"	Brit. Am. Corporation, Ltd	32.06	" 1299 "	17th " "
Black Fox	Ainsworth	James Dunsmuir	37.80	" 2176 "	13th " "
Bodie Fractional	Nelson	Falls View G. & S. M. Co., Ld. Ly.	3.62	" 4162 "	12th Dec., "
Bodie	"	" "	43.33	" 4164 "	13th " "
Blue Grouse	"	The Duncan Mines, Ltd	51.65	" 2553 "	30th " "
Baby Ruth	Slocan	Eleanor J. Kendall and Alfred R. Fingland	51.65	" 2229 "	28th July, "
Conder	"	N. W. Min. Syn., Ltd., C. S. Rushdall, E. Stewart, E. Pitt	40.51	" 3518 "	21st April, "
Cultus	"	J. A. Finch and E. J. Dyer	49.08	" 2891 "	2nd June, "
Copper Wonder	Trail	A. G. White and N. Reuter	33	" 3493 "	6th " "
Copper Chief	"	" "	32	" 3494 "	6th " "
Copper Queen	"	Copper Queen M. & Dev. Co., L.L.	.60	" 1210 "	8th " "
Commander	"	G. F. Caldwell, G. Harrison	46.91	" 3443 "	31st July, "

WEST KOOTENAY.—Continued.

Name of Claim.	District.	Name of Grantee.	Acres.	Description.	Date of Grant.
Columbia View....	Trail	G. F. Caldwell and G. Harrison .	49.14	Lot 3414, G. 1	31st July, 1899
California.....	Nelson.....	Wm. Moore	43.77	" 1677 "	29th Sept., "
Clyde Fraction....	Revelstoke..	Lillooet, Fraser R. and Cariboo Gold Fields, Ltd.....	3.05	" 2778 "	6th Mar., "
Constant	Slocan.....	A. W. McCune <i>et al.</i>	35.10	" 2817 "	9th Jan., "
Copper Belle	Nelson.....	Noontday M. Co., Ltd. Ly	40.65	" 3133 "	9th " "
Copper Queen	"	Baltimore G. M. & Dev. Co.....	45.97	" 3429 "	16th " "
Crown Point No. 6.	Slocan.....	Louis Heckman.....	23.33	" 2216 "	7th Feb., "
Canadian Queen...	Nelson.....	W. T. Mitchell	41.72	" 3240 "	11th " "
Carrie	Slocan.....	Louise W. Berens.....	7.94	" 2840 "	1st May, "
Courtland.....	Nelson.....	G. H. Green.....	39.80	" 3436 "	20th Mar., "
Coronation.....	Revelstoke..	Carnes Ck. Consol. G. Mines. Ltd.	46.66	" 3361 "	19th May, "
Continental.....	Slocan.....	Scottish Colonial G. Flds., Ltd ..	12.13	" 2097 "	31st " "
Copper King	Trail Creek .	The Can. Mutual M. & D. Co., Ltd.	44.94	" 1991 "	27th Oct., "
Concordia.....	"	J. A. Finch and Adelia Stussi ...	27.38	" 2943 "	26th " "
Columbia	"	R. S. Anderson	34.77	" 3972 "	20th " "
City of Paris	Nelson.....	London and Rossland (B. C.), Ltd.	46.46	" 3405 "	15th Nov. "
Copper Lily.....	"	"	51.65	" 3407 "	16th " "
California.....	Ainsworth ..	James Dunsmuir	21.50	" 2177 "	13th " "
Colorado Fraction..	Nelson.....	The Duncan Mines, Ltd	1.74	" 3934 "	30th Dec., "
Colorado.....	"	The Granite Gold Mines, Ltd....	18.91	" 634 "	30th " "
Cinderella.....	Slocan.....	Leonard B. Keyser.....	51.65	" 3621 "	3rd May, "
Dump Fraction....	Slocan.....	Native Silver Bell M. Co	4.20	" 2257 "	18th Jan., "
Dorothy	"	Ruth No. Two Mining Co., Ltd .	29.35	" 2034 "	28th April, "
Dominion	"	St. Keverne Mining Co.....	25.20	" 2641 "	18th May, "
Dinner Bucket	Nelson.....	Kennett M. & Dev. Co., Ltd. Ly ..	32.21	" 3806 "	7th April, "
Delley	Slocan.....	Daniel K. McDonald	51.08	" 2887 "	15th May, "
Dandy No. 2.....	Trail	Robt. Miller.....	46.14	" 2946 "	7th June, "
Drill.....	"	The B. C. Mining Co., Ltd. (For.)	51.65	" 3293 "	8th " "
Dayton.....	Slocan City .	Ed. S. Kinney	41.50	" 2419 "	24th " "
Deserter.....	Ainsworth ..	W. H. Aldridge	46.42	" 2845 "	13th Sept., "
Dewdney	Trail Creek .	C. E. Hope and K. L. Burnet ...	22.92	" 3017 "	13th " "
Denis	Nelson.....	London and Rossland (B. C.), Ltd.	20.65	" 3408 "	16th Nov., "
Dodo	"	"	44.10	" 3401 "	15th " "
Daisy.....	Ainsworth ..	James Dunsmuir.....	51.65	" 2175 "	14th " "
Escuminace	Trail Creek .	St. Clair G. M. Co	40.46	" 3118 "	6th April, "
Elkhorn	Ainsworth ..	Elkhorn Silver M. Co., Ltd	43.10	" 2428 "	15th May, "
Etruria Fraction...	Nelson.....	Fern G. M. and M. Co., Ltd	34.63	" 2161 "	16th Jan., "
Exeter.....	Slocan.....	St. Keverne Mining Co.....	13.70	" 2645 "	18th May, "
Echo	Ainsworth ..	Echo Mining & Milling Co., L. L.	17.00	" 2057 "	18th " "
Empire Fraction...	Revelstoke..	Carnes Ck. Consol. G. M., Ltd ...	46.08	" 3355 "	19th " "
Evening Star.....	Nelson.....	J. A. Turner and G. A. Kirk....	39.81	" 2014 "	7th April, "
Excelsior.....	Trout Lake..	Sunshine, Ltd	51.55	" 2621 "	2nd June, "
Ethel.....	Trail	B. C. Mining Co., Ltd. (For.)....	51.65	" 3292 "	8th " "
Emma Weber	"	J. E. Walter	23.74	" 3219 "	8th " "
Empire	Slocan.....	G. Gooderham	15.50	" 1477 "	12th " "
Egalite	Ainsworth ..	H. Sheran and W. Thomlinson ..	23.76	" 3103 "	26th " "
Eureka	Nelson.....	Hall Mines, Ltd	5.45	" 3255 "	7th Sept., "
Esther	Trail Creek .	Ruth Esther G. M. Co.....	23.09	" 3230 "	8th " "
Eureka No. 2.....	Slocan.....	War Eagle Con. M. & D. Co., L. L.	13.04	" 2284 "	7th Nov., "
Eagle Fraction....	"	C. E. Hope	8.43	" 3011 "	11th " "
Eagle.....	"	"	27.00	" 3031 "	11th " "
Emily Edith Fract.	" .....	" .....	.64	" 3217 "	13th " "
Erin.....	Slocan City .	D. Graham and Eric Saulter	51.65	" 1530 "	2nd Dec., "
Forest King.....	Trail Creek .	Martin Warner	37.68	" 3232 "	7th Sept., "
Fourth of July....	Slocan.....	Byron N. White	7.10	" 2138 "	18th Jan., "
Frankie H.....	Trail Creek .	T. E. Haley, F. Barker.....	51.57	" 1762 "	18th " "
Fred B.....	"	"	5.41	" 3203 "	18th " "
Felix No. 3.....	Slocan.....	St. Keverne Mining Co.....	5.30	" 2643 "	19th April, "
Free Coinage.....	Nelson.....	J. A. Gibson <i>et al.</i>	43.28	" 3586 "	18th Mch., "
Fool Hen	Trail	J. R. Stussi <i>et al.</i>	31.14	" 3297 "	8th June, "
Florence.....	Nelson.....	Alex. Goyette <i>et al.</i>	49.78	" 3237 "	22nd Aug., "
Faustina.....	Ainsworth ..	H. Shearn and W. Thomlinson..	48.48	" 3102 "	2nd " "

WEST KOOTENAY.—Continued.

Name of Claim.	District.	Name of Grantee.	Acres.	Description.	Date of Grant.
Florence	Ainsworth ..	Robt. F. Green & Saml. H. Green	33.95	Lot 2251, G.1	30th Dec., 1899
Gold Ring.....	Arrow Lake.	The Kamloops M. & D. Co., L.L.	32.81	" 1828 "	3rd Feb., "
Golden Gate.....	Nelson	London & Rossland (B.C.) Mining Co., Ld. Ly	39.40	" 2934 "	10th " "
Grand Union.....	Nelson	Reg. K. Neill.....	42.92	" 2467 "	10th " "
Gold Is	"	W. F. Askew <i>et al</i>	37.89	" 3244 "	16th " "
Good Day.....	Slocan	John Bough	31.28	" 2344 "	21st March, "
Good Day Fract'nal	"	"	4.26	" 2345 "	21st " "
General Sheridan..	"	Geo. Alexander	34.23	" 2066 "	1st May, "
Golden Gate.....	Ainsworth ..	Mollie J. Fraser.....	51.51	" 2253 "	26th " "
Glengarry.....	Revelstoke..	Lemuel Arthur <i>et al</i>	51.65	" 1971 "	5th June, "
Grey Wolf Fraction	Arrow Lake.	Silver Queen M. Co., Ld. Ly....	2.23	" 2209 "	31st May, "
Grey Wolf	"	"	47.08	" 2204 "	31st " "
Golden Bell	Ainsworth ..	G. S. Anderson, P. O. Erickson..	30.80	" 2648 "	1st June, "
Gladstone.....	Trail	Ed. Mahon, A. W. Siegel.....	34.47	" 2286 "	9th " "
Glasgow	Ainsworth ..	W. J. Whiteside.....	39.96	" 3321 "	27th Oct., "
Glasgow	Nelson	London & Rossland (B.C.), Ltd..	40.73	" 3404 "	15th Nov., "
Greenhorn Fraction	"	Erik O. Nelson and Jous P. Swed- berg	12.87	" 3691 "	7th " "
Golden Plate.....	Trail	The Golden Gate Con. M. Co., Ld.	51.50	" 4017 "	14th Dec., "
Granite.....	Nelson.....	The Granite G. M. Co	33.12	" 2550 "	30th " "
Hustler.....	Ainsworth ..	Elkhorn Silver Mining Co.	28.70	" 2431 "	15th May, "
Heba	Nelson	M. A. Bucket, C. D. McKenzie..	51.65	" 2439 "	17th " "
Hera	"	"	51.65	" 2438 "	17th " "
Hardup	"	Nelson Poorman G. M. Co., Ltd.	18.50	" 2551 "	24th Jan., "
Humming Bird....	"	Baltimore G. M. & Dev. Co., L.L.	24.50	" 3428 "	16th " "
Hope No. 2.....	Slocan City ..	Robt. Cooper, H. Sheran.....	48.86	" 2884 "	2nd Aug., "
Hillside.....	Nelson	Edmund J. Palmer.....	51.65	" 2238 "	28th April, "
Hazard Fraction..	Slocan	Frank Owen.....	12.61	" 1400 "	18th May, "
High Ore No. 2....	Trail	Robt Miller	43.97	" 2945 "	7th June, "
Hall	"	G. F. Caldwell, G. Harrison.....	39.97	" 3964 "	31st July, "
Horseshoe	Slocan City ..	J. H. A. Chapman <i>et al</i>	36.24	" 3965 "	21st Aug., "
Highland Chief....	Nelson.....	Charles Faas <i>et al</i>	49.47	" 2880 "	14th Sept., "
Harriet.....	Ainsworth ..	W. J. Whiteside.....	47.50	" 3319 "	27th Oct., "
Havana.....	Slocan	Henrietta Gintzburger	51.65	" 3186 "	24th " "
Irma	Nelson.....	Noonday M. Co., Ld. Ly.....	51.65	" 3426 "	9th Jan., "
Imperial	Revelstoke..	Carnes Ck. Consol. Mines, Ltd ..	51.65	" 3360 "	19th May, "
Iron Mountain....	Ainsworth ..	R. G. Talton	40	" 2841 "	29th " "
Iron Mask.....	Slocan	N. W. M. & M. Synd, Ltd., C. S. Rashdall, E. Stewart, E. Pitt.	51.65	" 3520 "	21st April, "
Iron Mask Fraction	Slocan	"	10.25	" 3521 "	21st " "
Indication.....	Ainsworth ..	Richelien Mining Co., Ltd	40.12	" 2863 "	18th July, "
Irene Fraction....	Slocan	H. B. Alexander.....	9.77	" 4530 "	14th Nov., "
Iron Clad	"	Charles E. Hope	25	" 3216 "	13th " "
Jo-Jo.....	Slocan	A. L. Davenport, W. Hunter....	35.75	" 1839 "	9th Feb., "
Jenny Lind	Nelson	London and Rossland (B.C.), Min- ing Co., Ltd	38.85	" 2933 "	10th " "
Jeannette.....	Slocan	Frank Kelly.....	37.50	" 1926 "	19th May, "
Jubilee Fraction..	Revelstoke..	Carnes Ck. Consol. G. Mines, Ld.	48.52	" 3359 "	19th " "
Jubilee	Nelson	W. J. Nelson.....	30.15	" 3026 "	7th April, "
Jessie A	Ainsworth ..	Laurier M. and M Co.	24	" 3347 "	2nd June, "
Joseph Leister....	Trail	W. A. Spilker	27.75	" 3485 "	6th " "
Jeannette.....	Ainsworth ..	W. S. McCrea	9.50	" 3343 "	12th " "
James Stanley	Trail	David B. Forster.....	48.89	" 3844 "	2nd Aug., "
Jupiter	Nelson.....	Falls View G. & S. M. Co., Ld. Ly.	50.59	" 4165 "	13th Dec., "
Keyser Fractional .	Slocan	Leonard B. Keyser.....	17.41	" 784 "	3rd May, "
Kingdom Fraction .	Revelstoke..	Carnes Ck. Consol. G. Mines, Ld.	34.07	" 3356 "	19th " "
Kitchener Fraction.	Slocan	Wm. Hoover Yawkey and Philip G. Hickey.....	47.33	" 3107 "	26th Oct., "
Kasu Fraction.....	Slocan	Sunshine Mining Co., Ltd.....	14	" 3100 "	25th " "
Little Ralph.....	Ainsworth ..	Elkhorn S. M. Co., Ltd	4.50	" 2429 "	15th May, "

WEST KOOTENAY.—Continued.

Name of Claim.	District.	Name of Grantee.	Acres.	Description.	Date of Grant.
Lytton.....	Nelson.....	Lerwick G. M. Co.....	39.48	Lot 2194, G.1	9th Jan., 1899
Lucky Strike.....	Ainsworth..	Chas. A. Fleming <i>et al.</i>	51.65	" 2929 "	23rd " "
Lizzie C.....	Nelson.....	John Fred Hume and Thos. C. Collins.....	16.85	" 3587 "	18th Mar., "
Laurier.....	Ainsworth..	The Laurier M. and M. Co.....	24.50	" 3346 "	2nd June, "
Laura M.....	".....	W. F. Stroebeck & J. R. Hardie.	43.17	" 2326 "	3rd " "
Lincoln Fraction...	Trail.....	J. J. Henager <i>et al.</i>.....	.23	" 2850 "	22nd " "
Little Giant Fract.	".....	The Can. Mutual M. & D. Co., Ltd.	22.02	" 1992 "	27th Oct., "
Little Vita.....	".....	" " " " " " " "	38.21	" 1989 "	27th " "
Lincoln No. 2.....	".....	David Glass.....	30.03	" 2972 "	25th " "
Little Montana.....	Slocan City.	John F. McRae.....	35.85	" 2889 "	3rd Nov., "
Lucky Jack.....	".....	Robt. Bradshaw.....	43.97	" 3883 "	10th " "
Little Blue Grouse.	Nelson.....	Freeman E. White.....	51.58	" 2987 "	28th " "
Morning Star.....	Trail Creek..	Sault St. Marie G. M. Co., Ltd.	14.45	" 3023 "	3rd May, "
My Emer.....	Nelson.....	Nelson Poorman G. M. Co., L. L.	13.94	" 2558 "	24th Jan., "
Myrtle No. 1.....	Trail.....	Charles Carr.....	37.44	" 3074 "	15th " "
Metlakhatla.....	Nelson.....	Michael J. Maloney.....	39.1	" 3334 "	16th Feb., "
Millie Mack.....	Arrow Lake.	The Kamloops M. & D. Co., L. L.	51.65	" 1831 "	6th " "
Morning Star No. 7.	Slocan City..	John F. McRae.....	51.34	" 2398 "	28th April, "
Maggie.....	Nelson.....	W. P. Robinson and Thos. J. Lendrum.....	1.86	" 2346 "	4th " "
Morning Star.....	Nelson.....	Ernest Kennedy, Jas. L. Parker.	47.89	" 3779 "	7th " "
Money Market.....	".....	John Elliot and A. H. Buchanan.	11.98	" 3252 "	31st May, "
Millsite.....	".....	Athabasca Gold Mine, Ltd.....	5	" 2814 "	10th April, "
Meteor.....	Slocan.....	John A. Finch <i>et al.</i>	40.37	" 2893 "	2nd June, "
Mac Fractional....	Nelson.....	The Hall Mines, Ltd.....	1.77	" 3256 "	7th Sept., "
Medford.....	Slocan.....	Leonard B. Keyser.....	32.86	" 3622 "	8th " "
Monday Fraction..	".....	Sunshine M Co., Ltd.....	14.31	" 3095 "	25th Oct., "
Montreal.....	Trail Creek.	Louis Lienemann <i>et al.</i>	5.42	" 3013 "	24th " "
Mine.....	Slocan.....	Sunshine M. Co., Ltd.....	34.21	" 3099 "	20th " "
Monday.....	".....	" " " " " " " "	42.62	" 3094 "	18th " "
Mineral Hill.....	".....	War Eagle Con. M. & D. Co., Ltd.	17.25	" 2285 "	7th Nov., "
Majestic.....	".....	Frank H. Bourne & Chas. French	44.85	" 1405 "	7th Dec., "
Minnie.....	Nelson.....	The Duncan Mines, Ltd.....	43.68	" 3931 "	30th " "
Moken Bird Fract.	".....	" " " " " " " "	12.88	" 3932 "	30th " "
Noonday.....	Nelson.....	Noonday M. Co., Ltd. Ly.....	51.65	" 3425 "	9th Jan., "
Naoma.....	Slocan.....	B. C. Gold Trust, Ltd.....	47.11	" 2516 "	23rd " "
Nelson No. 5.....	Slocan City.	John MacKinnon.....	51.65	" 2215 "	8th Feb., "
Nancy Hanks No. 2	".....	Harry E. Graves <i>et al.</i>	29.72	" 2421 "	9th " "
Nelson No. 2.....	Trail Creek.	Philip Aspinwall.....	26.37	" 1448 "	17th " "
New Park.....	Slocan.....	Frank Owen.....	28.12	" 1398 "	18th May, "
Nevada.....	Nelson.....	Robert C. Pollett.....	48.50	" 3504 "	7th April, "
Number 2.....	".....	Edmund C. Traves <i>et al.</i>	51.65	" 3140 "	6th June, "
Normandy.....	Ainsworth..	Elias Fitterling.....	42.19	" 2336 "	8th " "
No. 1 Le Blanc Grp.	Trail.....	B. C. Mining Co., Ltd. (For.)..	48.94	" 3288 "	8th " "
No. 2 Le Blanc Grp.	".....	" " " " " " " "	28.04	" 3289 "	8th " "
No. 3 Le Blanc Grp.	".....	" " " " " " " "	28.68	" 3290 "	8th " "
Northern Light....	".....	" " " " " " " "	48.18	" 3291 "	8th " "
Number 27.....	Ainsworth..	Aubrey L. White.....	1.14	" 3344 "	13th Sept., "
Norman.....	".....	Jerome L. Drumheller.....	20.66	" 3339 "	28th " "
North Exchange Fr.	Slocan City.	Robt. A. Bradshaw <i>et al.</i>	40.47	" 2615 "	8th Nov., "
Northern Belle....	Slocan.....	Ed. F. Murphy, H. Dobeny.....	51.36	" 3173 "	10th " "
Nevada.....	Nelson.....	The Duncan Mines, Ltd.....	20.30	" 637 "	30th Dec., "
Nevada Fraction...	".....	" " " " " " " "	18.23	" 3933 "	30th " "
No. 5.....	Ainsworth..	James Mashton & Chas. S. Allman	42.53	" 3655 "	30th " "
Opollo.....	Ainsworth..	Maurice A. Bucke.....	50.14	" 2440 "	17th May, "
Oma.....	Slocan.....	Francis O. Berg.....	51.65	" 2616 "	18th " "
Ophir.....	Trail Creek.	Jumbo G. M. Co. (For.).....	9.20	" 1829 "	23rd June, "
October.....	Nelson.....	Kenneth M. & Dev. Co., Ltd....	51.51	" 3804 "	7th April, "
October Fractional.	".....	" " " " " " " "	25.60	" 3805 "	7th " "
Ottawa No. 5.....	Slocan.....	John A. Finch <i>et al.</i>	38.31	" 2892 "	2nd June, "
Oakland.....	Trail.....	Joseph E. Walter.....	45.50	" 3220 "	8th " "
O. V. G. Fraction..	Nelson.....	The Hall Mines, Ltd.....	21.44	" 3254 "	7th Sept., "

WEST KOOTENAY.—Continued.

Name of Claim.	District.	Name of Grantee.	Acres.	Description.	Date of Grant.
Oscar Fraction....	Ainsworth ..	Wm. Jas. Whiteside.....	2.96	Lot 3322, G.1	27th Oct., 1899
Ore-or-no-go	Trail	East LeRoi M. Co., Ltd	1.80	" 696 "	20th " "
Oregon	Slocan	Sunshine M. Co., Ld. Ly	46.20	" 3098 "	20th " "
Pluto Fraction....	Nelson	M. A. Bucke.....	32.40	" 2441 "	6th April, "
Panama	Ainsworth ..	Henry Giegerich & Mary Mackay	51.65	" 3152 "	26th Jan., "
Pine Log.....	Slocan City ..	A. M. Johnson.....	51.65	" 1258 "	28th April, "
Prescott.....	Slocan	Prescott M. Co., Ld. Ly.....	17.75	" 3028 "	27th " "
Prescott Fraction..	"	"	23.42	" 3029 "	27th " "
Princess Ida.....	Nelson	Michael Egan <i>et al</i>	49.94	" 3279 "	29th " "
Payne Fraction....	Slocan	St. Keverne M. Co.....	1.40	" 2646 "	19th " "
Pembroke.....	"	Frank Owen.....	51.65	" 1399 "	18th May, "
Prince Edward	Revelstoke..	Lemuel Arthur <i>et al</i>	51.65	" 1973 "	5th June, "
Pilot	Trail	B. Tomkins <i>et al</i>	36.53	" 3439 "	8th " "
Paul Boy	"	Daniel C. Corbin.....	18.80	" 1644 "	9th " "
Princess Louise	"	Jas. B. McArthur.....	29.27	" 2677 "	2nd Aug., "
Parrot	Trail Creek ..	Jos. Vogel and D. Berryman	3.75	" 1939 "	15th Sep., "
Pontiac.....	Ainsworth ..	Nelson-Slocan Pros. & M. Synd., Ld. Ly.....	21.51	" 2265 "	29th " "
Peoria	"	W. J. Whiteside.....	51.65	" 3318 "	24th Oct., "
Pulaskie.....	Slocan City ..	John F. McRac.....	13.09	" 2890 "	3rd Nov., "
Phœnix.....	Ainsworth ..	M. J. Mahony and A. F. Adams.	51.65	" 3336 "	8th Dec., "
Quebec	Slocan	Wm. Harrison.....	36.68	" 2885 "	23rd Jan., "
Robin	Slocan	Hy. B. Alexander, F. W. Godsall	22.36	" 1404 "	16th " "
Rio	"	Ernest A. Bielenberg <i>et al</i>	51.65	" 2093 "	2nd Feb., "
Ramping Lion....	Trail Creek ..	Edw. R. C. Clarkson, Daniel C. Coakley.....	47	" 1859 "	2nd " "
Relief Fraction....	Nelson	John A. Finch.....	3.34	" 2469 "	11th " "
Rockford	"	Geo. H. Green.....	50.11	" 3435 "	20th Mar., "
Rushford	Slocan	Geo. Alexander.....	43.34	" 2068 "	1st May, "
Rosebery	Revelstoke..	Carnes Ck. Con. G. Mines, Ltd..	48.52	" 3354 "	19th " "
Red Fox	Arrow Lake..	Silver Queen M. Co., Ld. Ly....	6	" 2413 "	21st Nov., "
Red Fox.....	"	"	33.23	" 2205 "	31st May, "
Racatam.....	Nelson	Kenneth M. & Dev. Co., Ld. Ly.	41.80	" 3803 "	7th April, "
Red Top.....	Trail	The B. C. Mg. Co., Ltd. (For.) ..	50.25	" 3294 "	8th June, "
Richmond.....	Slocan	Geo. Gooderham	34.30	" 1472 "	9th " "
Random Shot	"	The Ajax M. & Dev. Co., Ltd. . .	8.61	" 1726 "	28th Aug., "
Ruth.....	Trail Creek ..	Ruth Esther G. M. Co.....	37.09	" 3229 "	8th Sept., "
Red Fox Fraction..	Arrow Lake..	The Silver Queen M. Co., Ld. Ly.	1.37	" 2414 "	21st Nov., "
Richmond.....	Trail	Finnimore M. McLeod.....	30.96	" 1508 "	23rd " "
Red Star.....	Ainsworth ..	Geo. Brine	51.65	" 2833 "	30th " "
Royal Canadian....	Nelson	The Granite Gold Mines, Ltd. . .	20.66	" 633 "	30th Dec., "
Red Rock Fraction.	"	"	24.16	" 2551 "	30th " "
Roy No. 2	"	"	45.38	" 3930 "	30th " "
Shunia	Slocan	Geo. Alexander	7	" 2067 "	1st May, "
Snowstorm Fraction	" .....	" .....	.30	" 3445 "	20th Mar., "
St. Keverne.....	"	St. Keverne M. Co.....	37.50	" 2642 "	18th May, "
Sunlight.....	Ainsworth ..	Echo Min. & Milling Co., Ld. Ly.	45	" 2058 "	18th " "
St. Bernhard... ..	Trail Creek ..	Victor Monnier	50.59	" 3223 "	7th April, "
Salisbury	Revelstoke..	Carnes Creek Con. G. Mines, Ltd.	51.65	" 3357 "	19th May, "
Smeralda	Slocan City ..	J. C. Gray and H Mackay	14.81	" 2424 "	31st " "
Slocan Sovereign..	Slocan	Slocan Mines Exp. & Dev. Co. of Sandon	25.47	" 1927 "	1st June, "
Seal	Trail Creek ..	Edw. Airey	42.05	" 1937 "	26th May, "
Sea Bird.....	"	"	36.43	" 1936 "	26th " "
Starlight Fraction	Slocan	E. H. Tomlinson, W. A. Hendryx	4.54	" 2343 "	19th April, "
Sunshine.....	Nelson	W. H. Corbould	41.50	" 2389 "	19th " "
Silver Bell	Ainsworth ..	G. S. Anderson, P. O. Erickson.	47.60	" 2647 "	1st June, "
Shoe Swap.....	Slocan	Patrick S. Byrne.....	48.39	" 3158 "	29th May, "
Sultana.....	"	N. W. Mining Synd., Ltd. <i>et al</i> ..	46.75	" 3519 "	21st April, "
Spitzee Fraction..	Trail	Wm. T. Oliver.....	9.91	" 2520 "	6th June, "
Silver Champion...	"	W. de V. Le Maistre.....	27.55	" 3438 "	7th " "
Star View.....	Slocan	Geo. Gooderham	34.90	" 1473 "	12th " "

WEST KOOTENAY.—*Concluded.*

Name of Claim.	District.	Name of Grantee.	Acres.	Description.	Date of Grant.
Sam Hayes.....	Trail Creek..	Mary E. Rammelmeyer and Frank W. Hunt.....	2.27	Lot 3014, G.1	13th June, 1899
Sunset.....	Lardeau....	Geo. D. Scott.....	51.65	" 1970 "	27th July, "
Swiss.....	Nelson.....	Charles Faas <i>et al.</i>	43.10	" 2879 "	14th Sept., "
Silver Bow.....	Illecillewaet.	Fish R. Copper & Silver M. Co..	20.66	" 2782 "	17th Feb., "
Silver Bell No. 2..	Slocan.....	Native Silver Bell M. Co.....	51.65	" 2092 "	23rd Jan., "
Summit.....	Nelson.....	David D. Birks.....	38.64	" 3427 "	18th " "
Second Relief.....	".....	John A. Finch.....	42.07	" 2463 "	11th Feb., "
Star Shine.....	".....	".....	29.24	" 2466 "	11th " "
Sunshine.....	Slocan.....	Sunshine Mining Co., Ld. Ly....	51.47	" 3096 "	18th Oct., "
Snowflake.....	Ainsworth..	Wm. Jas. Whiteside.....	43.30	" 3320 "	3rd Nov., "
Swansea.....	Nelson.....	London & Rosslund (B. C.), Ltd..	50.95	" 3406 "	16th " "
Star.....	".....	John Blomberg <i>et al.</i>	51.65	" 3687 "	7th " "
Scotch Thistle.....	Slocan City..	R. C. Campbell Johnston.....	51.65	" 2290 "	10th " "
St. Charles.....	Slocan.....	Wm. Sudrow.....	41.71	" 3264 "	16th " "
Standard.....	Nelson.....	Falls View G. & S M. Co., Ltd..	51.65	" 4163 "	13th " "
Saratoga.....	Trail.....	The Golden Gate Con. M. Co., Ld.	51.41	" 4016 "	14th " "
Toothpick Fraction	Slocan.....	Alfred W. McCune <i>et al.</i>	21.47	" 2816 "	17th Feb., "
Tiger No. 2.....	Nelson.....	Henry Giegerich.....	32.59	" 2273 "	28th April, "
Tamarac.....	".....	Kenneth M. & Dev. Co., Ltd....	51.51	" 3802 "	7th " "
Tam Rak.....	Ainsworth..	Albert Lind, Alfred Stalberg....	15.60	" 3341 "	17th May, "
Trail.....	".....	W. H. Aldridge.....	51.65	" 3822 "	13th Sept., "
Tecumsie.....	".....	Nelson-Slocan Pros. & M. Co., Ld.	16.41	" 2261 "	29th " "
Tillie H.....	Trail Creek.	The Can. Mutual M. & D. Co., Ld.	49.96	" 1990 "	27th Oct., "
Tat Fraction.....	".....	Will. G. Adamson.....	11.33	" 3298 "	25th " "
Tyro.....	Slocan.....	N. W. Mining Synd., Ltd.....	9.33	" 3113 "	24th Nov., "
Tyro.....	".....	".....	51.50	" 3111 "	23rd Oct., "
Tiger.....	Nelson.....	Geo. A. Kirk.....	41.19	" 2010 "	9th Dec., "
Telephone.....	Slocan.....	Payne Con. M. Co., Ld., Non-p Ly.	37.20	" 3185 "	12th " "
Tamarack.....	Nelson.....	The Duncan Mines Ltd.....	32.37	" 2552 "	30th " "
United.....	Slocan.....	Echo M. & M. Co., Ld. Ly....	41.56	" 2059 "	1st May, "
Ural.....	Trail.....	Robt. Miller.....	33.96	" 2944 "	7th June, "
Unexpected.....	Slocan.....	Frank H. Bourne, Charles French	39.36	" 2231 "	8th Dec., "
Vancouver.....	Ainsworth..	Dom. M., Dev. & Agency Co., L.L.	24.56	" 2024 "	31st May, "
Vigilant.....	Nelson.....	Wm. H. Mitchell.....	28.30	" 3338 "	15th " "
Virginia.....	Ainsworth..	Michael J. Mahoney, August F. Adams.....	39.20	" 3337 "	28th Oct., "
White.....	Nelson.....	Nelson Poorman G. M. Co., Ltd.	20.66	" 2556 "	24th Jan., "
Warwick Fraction.	Revelstoke..	Lillooet, Fraser River & Cariboo Gold Fields, Ltd.....	1.48	" 2776 "	6th Mar., "
Wisconsin.....	Nelson.....	Chas. A. Fleming <i>et al.</i>	51.65	" 2928 "	23rd Jan., "
Wolf.....	Arrow Lake.	The Kamloops M. & D. Co., L.L.	51.65	" 1830 "	6th Feb., "
Wide West.....	Trail Creek..	Ross Thompson, Dan. Burke....	18.8	" 1287 "	17th " "
W. J. Bryan.....	Nelson.....	Geo. H. Green.....	32.80	" 3434 "	20th Mar., "
White Rabbit.....	Nelson.....	Henry McCandless.....	51.65	" 3496 "	8th May, "
War Eagle.....	Ainsworth..	D. F. Strobeck, O. E. Bolling..	44.48	" 2323 "	3rd June, "
Waters Meet.....	Trail.....	The Golden Plate Con. M. Co., Ld.	50.05	" 4015 "	14th Dec., "
White Swan Fract.	Nelson.....	The Duncan Mines, Ltd.....	9.57	" 2554 "	30th " "
White Swan.....	".....	The Granite Gold Mines, Ltd....	51.65	" 2549 "	30th " "
Yellow Dog.....	Nelson.....	Albert L. Keller.....	51.65	" 2938 "	20th Mar., "
Yellow Stone.....	".....	Hugh M. Billings & Thos. Bennett	50.08	" 3651 "	2nd Aug., "
Yreka Fraction....	Trail Creek..	Mt. Sicker & B.C. Dev. Co., Ltd.	8.90	" 3846 "	22nd " "
Yakima.....	Slocan.....	Sunshine Mining Co., Ld. Ly....	40.20	" 3097 "	20th Oct., "

LILLOOET.

Ben d'Or Fraction..	Lillooet.....	Ben d'Or Mines, Ld., Non-p. Ly.	5.58	Lot 541, G.1	3rd Aug., 1899
Gem.....	".....	Robt. G. Tatlow.....	47.35	" 525 "	6th June, "

LILLOOET.—*Concluded.*

Name of Claim.	District.	Name of Grantee.	Acres.	Description.	Date of Grant.
Jim Crow Fraction.	Lillooet.	Ben d'Or Mines, Ltd., Non-p. Ly.	.90	Lot 542, G. 1	3rd Aug., 1899
Little Joe.....	"	"	51.65	" 539 "	3rd " "
Maud	"	R. G. Tatlow	15.75	" 524 "	6th June, "
Post	"	"	51.65	" 529 "	6th " "
Stanley	"	"	14.37	" 527 "	6th " "
White Cross	"	Ben d'Or Mines, Ltd., Non-p. Ly.	42.64	" 540 "	3rd Aug., "

YALE.

Arlington Fraction.	Kettle River.	E. A. Bielenberg.....	13.85	Lot 1110, G. 1	20th Mar., 1899
Ætna	"	Chas. E. Gault.....	24.91	" 978 "	12th Aug., "
Ajax.....	Grand Forks.	Thos. M. Daly.....	40.26	" 1509 "	11th Dec., "
Ajax Fraction	"	"	9.49	" 1512 "	11th " "
Buckhorn.....	Kettle River.	Isaac H. Hallett	51.65	" 1107 "	28th Apr., "
Blue Bell	"	E. A. Bielenberg.....	47.69	" 1108 "	28th " "
Big Ledge.....	"	Boundary Ck. M. & M. Co., L.L.	51.65	" 826 "	12th May, "
Bee	"	D. A. Holbrook <i>et al</i>	45	" 886 "	2nd June, "
Bonnie Belle.....	"	Robt. Wood.	51.18	" 880 "	12th Aug., "
Blaylock	Osoyoos	J. B. McArthur <i>et al</i>	51.65	" 1788 "	18th " "
Bullion	Kettle River.	Angus Stuart <i>et al</i>	41.52	" 865 "	29th Sept., "
Barbara	"	Geo. A. Rendell.....	28.50	" 817 "	6th Oct., "
Bon Diable.....	Vernon	Bon Diable Mining Co., Ld. Ly..	51.65	" 1179 "	18th " "
Beech	Grand Forks.	DeWitt C. Beach <i>et al</i>	43	" 1044 "	3rd Nov., "
Butte City.....	Kettle River.	Chas. R. Garland <i>et al</i>	47.84	" 1230 "	4th " "
Ben Hur No. 1	Grand Forks.	The Rathmullen Consol. M. & D. Co., Ltd., of Rossland, B. C....	37.99	" 1503 "	9th " "
Bradford.....	Grand Forks.	Edward Airey	45.81	" 1791 "	10th " "
Black Bear Fract'l.	Kettle River.	The Silver Queen M. Co., Ld. Ly.	25.82	" 2582 "	21st " "
City of Denver	Grand Forks.	J. P. Graves.....	21.30	" 1161 "	29th May, "
C. S. & H.....	Kettle River.	Boundary Ck M. & M. Co., L. L.	40.41	" 833 "	12th " "
Caledonia.....	Grand Forks.	Robt. T. Daniels, Geo. Hicken ..	39.84	" 973 "	23rd " "
Cariboo Fraction ..	Osoyoos	Minnie-ha-ha G. M. & M. Co....	4.80	" 925 "	7th June, "
Cimeron	Kettle River.	Geo. W. Rumberger.....	48.60	" 980 "	12th Aug., "
Columbia	Grand Forks.	Marcus Oppenheimer <i>et al</i>	51.65	" 1157 "	16th Oct., "
Central City	"	Hugh St. Quentin Cayley.....	38.35	" 957 "	14th " "
Combination	Kettle River.	The Combination M. & M. Co ..	51.65	" 1458 "	8th Nov., "
Cyclops.....	Grand Forks.	John F. Hill <i>et al</i>	8.55	" 1244 "	14th " "
D. A	Kettle River.	The Boundary Ck. M. & M. Co., Ld.	51.65	" 824 "	12th May, "
Dream.....	Osoyoos	Thos. Pinch, John Nelson.	51.65	" 1160 "	8th June, "
Daly	Grand Forks.	Thos. M. Daly.....	36.46	" 1510 "	11th Dec., "
Dandy.....	Vernon	The Camp Hewett M. & D. Co., Limited Liability.....	40.10	" 1175 "	14th " "
E. C. B.....	Kettle River.	The Bound'y Ck. M. & M. Co., Ld.	51.65	" 827 "	12th May, "
Excelsior	Osoyoos	Clement Vacher, M. Howard....	51.65	" 997 "	7th Dec., "
Ethiopia.....	Kettle River.	Brit. Can. G. Fields Expl., Dev. & Investment Co., Ltd.....	42.38	" 932 "	30th " "
Flora	Osoyoos	W. Dalrymple <i>et al</i>	35.50	" 1086 "	30th May, "
Fred D	Kettle River.	Boundary Ck. M. & M. Co., Ltd.	49.91	" 830 "	12th " "
Fourth of July	"	J. P. Graves.....	29	" 922 "	12th Aug., "
Gem	Kettle River.	John Dunn, E. A. Bielenberg ...	51.65	" 697 "	25th Jan., "
G. A. R	"	Boundary Ck. M. & M. Co., L.L.	51.65	" 822 "	12th May, "
Golden Crown Frac.	Osoyoos	Minnie-ha-ha G. M. & M. Co....	3.10	" 924 "	7th June, "

YALE.—Continued.

Name of Claim.	District.	Name of Grantee.	Acres.	Description.	Date of Grant.
Gray Eagle.....	Kettle River.	J. P. Graves.....	53.80	Lot 793, G.1	9th Nov., 1899
Gold Drop Fract'l.	"	F. C. Innes.....	13.54	" 1252 "	10th " "
Gold Bug.....	Osoyoos ...	D. W. Holbrook.....	39.67	" 890 "	28th " "
Hamilton.....	Kettle River.	Wm. Jas. Harris... ..	51.41	" 1106 "	12th June, "
Hidden Treasure ..	"	Ned Bennet & E. A. Bielenberg..	51.65	" 1266 "	26th July, "
Helen.....	"	The Boundary Helen G. M. Co., Limited Liability	29.94	" 691 "	12th Aug., "
Helen Ray No 1...	Grand Forks.	The Rathmullen Consol. M. & D. Co., Ltd., of Rossland, B. C... ..	27.67	" 1501 "	9th Nov., "
Hecla.....	Grand Forks.	Randolph Stuart & Evelyn Smith	39.90	" 859 "	12th Dec., "
Helena No. 2.....	Osoyoos ...	Otto Johnson.....	50.55	" 1790 "	15th Aug., "
Idaho.....	Kettle River.	Donald McLaren <i>et al</i>	47.7	" 981 "	9th Feb., "
Iron Top.....	"	E. A. Bielenberg.....	51.65	" 1109 "	28th Apr., "
Islander.....	Osoyoos ...	Julius Brethour.....	50.18	" 1190 "	17th May, "
International.....	"	C. de B. Green, E. A. Stoddart..	48.07	" 1076 "	6th June, "
Ione.....	Grand Forks.	Rathmullen Con. M. & Dev. Co., Ltd., of Rossland, B. C... ..	47.90	" 1505 "	9th Nov., "
J. A. C.....	Kettle River.	Boundary Ck. M. & M. Co., Ltd.	51.39	" 823 "	12th May, "
Keystone.....	Grand Forks.	Geo. W. Rumberger <i>et al</i>	20.66	" 1155 "	21st Jan., "
Lakeside Fraction.	Kettle River.	Seth Emerson, J. A. Cameron...	22.15	" 1023 "	18th " "
Little Babe.....	Grand Forks.	John T. O'Brien.....	30.33	" 964 "	18th " "
Lake View.....	Vernon.....	Camp Hewett M. & D. Co., Ltd.	51.65	" 1001 "	1st June, "
Lady of the Lake..	Kettle River.	Eugene German <i>et al</i>	18	" 1171 "	1st Aug., "
Ladoga.....	"	John W. Blough <i>et al</i>	48.01	" 917 "	1st " "
Lookout.....	Grand Forks.	Wm. T. Smith <i>et al</i>	44.12	" 930 "	12th Oct., "
Little Bertha....	"	Albert T. Kendrick	37.72	" 959 "	12th Dec., "
Lewellah.....	Kettle River.	Brit. Can. G. Fields Expl., Dev. & Investment Co., Ltd.... ..	51.42	" 1251 "	30th " "
Mother Lode.....	Kettle River.	B. C. Copper Co. Ltd.	20.66	" 704 "	26th Jan., "
Mountain View....	Vernon.....	Camp Hewett M. & D. Co., L. L.	51.65	" 1000 "	1st June, "
Minnie.....	Osoyoos ...	F. A. Averill <i>et al</i>	51.65	" 1096 "	6th " "
Montezuma.....	Kettle River.	D. D. Mann and G. A. Cox	45	" 915 "	14th Sept., "
Mammie.....	Grand Forks.	J. J. McMullen, C. Cosgriff....	29.70	" 1246 "	23rd Oct., "
Marguerite.....	Kettle River.	E. C. Brown, D. M. McMartin..	50.39	" 836 "	17th " "
Malta No. 1.....	Grand Forks.	The Rathmullen Con. M. & Dev. Co., Ltd	51.65	" 1500 "	9th Nov., "
Maple Leaf.....	Grand Forks.	" " "	48.42	" 1502 "	9th " "
Mother Lode.....	"	Thos. M. Daly.....	51.65	" 1508 "	11th Dec., "
Mother Lode Frac..	"	"	1.65	" 1511 "	11th " "
Neta.....	Grand Forks.	Lillooet, Fraser R. & Cariboo G. Fields, Ltd.....	50.59	" 996 "	29th May, "
Nevada.....	Grand Forks.	Charles Matheson.....	48.90	" 1365 "	29th " "
No. 1.....	"	Alex. McKenzie.....	34.50	" 1362 "	29th " "
North Star.....	Kettle River.	C. L. Thomet, R. Wood	14.88	" 1165 "	17th Oct., "
North Star Fract'n.	Grand Forks.	Rathmullen G. M. Co., Ltd., of Rossland.....	16.52	" 1504 "	9th Nov., "
Offspring.....	Grand Forks.	B. C. Copper Co	2.95	" 1254 "	21st Jan., "
Oregon Fraction...	"	Henry White.....	3.73	" 1162 "	29th May, "
O. B.....	Kettle River.	The Boundary Ck. M. & M. Co., Limited Liability	48.03	" 828 "	12th " "
O. P.....	Grand Forks.	John H. Smith	38.10	" 1354 "	20th Oct., "
Orphan.....	"	A. W. Pelly and G. F. Hodgson.	44.16	" 1166 "	14th Nov., "
Phoenix.....	Kettle River.	C. E. Gault.....	29.94	" 894 "	17th May, "
Prospective.....	"	Boundary Ck. M. & M. Co., Ltd.	40.29	" 825 "	12th " "
P. H.....	"	" " "	50.33	" 829 "	12th Mar., "
Prinrose.....	"	B. C. Copper Co., Ltd.....	27.46	" 927 "	8th Nov., "
Queen Lill.....	Osoyoos ...	Jos. B. McArthur <i>et al</i>	44.33	" 1783 "	18th Aug., "

COAST—NANAIMO.—*Concluded.*

Name of Claim.	District.	Name of Grantee.	Aeres.	Description.	Date of Grant.
Blucher.....	Nanaimo....	Wm. A. Bauer.....	49.22	Lot 288, R. 1	19th May, 1899
Banker.....	".....	Fairfield Expl. Syndicate, Ltd....	41.77	" 291 "	17th " "
Blue Bell.....	".....	B. C. Exploring Syndicate, Ltd....	51.20	" 258 "	8th Dec., "
Comox Fraction...	".....	Fairfield Expl. Synd., Ltd.....	19.85	" 297 "	17th May, "
Chimnang.....	".....	".....	51.23	" 319 "	17th " "
Contact Fraction...	".....	Wm. A. Bauer.....	.75	" 326 "	19th " "
Comox.....	".....	Chas. Moody <i>et al.</i>	51	" 296 "	15th Aug., "
Copper Canion....	".....	A. St. G. Hamersley.....	51	" 22 G.	19th Apr., "
Cornell.....	".....	Van Anda Copper & G. Co., Ltd.	51.65	" 201 Tex.	17th Oct., "
Colossus.....	".....	B. C. Exploration Syndicate, Ltd.	46.80	" 256 R. 1	8th Dec., "
Champhness Fract'n.	".....	".....	8.40	" 260 "	8th " "
Dorothy Morton Fr.	".....	Fairfield Expl. Synd., Ltd.....	23.30	" 300 "	17th May, "
Douglas.....	".....	".....	48.74	" 320 "	17th " "
Don.....	".....	Thos. Andrews.....	41.42	" 337 "	18th Oct., "
Eva.....	".....	Fairfield Expl. Synd., Ltd.....	42.14	" 254 "	17th May, "
Lorindale.....	".....	Charles Hayward.....	51.65	" 146 Tex.	25th Jan., "
Marble Bay.....	".....	John J. Palmer.....	41.20	" 154 Tex.	18th Apr., "
Marble Bay Fr. No.1	".....	".....	10.22	" 155 "	18th " "
Marble Bay Fr. No.2	".....	".....	26.80	" 157 "	18th " "
Maggie May.....	".....	Fairfield Expl. Synd., Ltd.....	24	" 322 R. 1	1st Aug., "
Mainland.....	".....	J. E. Miller, Samuel Howe.....	51.65	" 336 "	10th Oct., "
Mainland Fraction.	".....	Thos. Andrews.....	9	" 335 "	11th " "
Perey.....	".....	Fairfield Expl. Synd., Ltd.....	49.52	" 299 "	17th May, "
Portage.....	".....	B. C. Exploring Synd., Ltd.....	51.65	" 259 "	8th Dec., "
Rose.....	".....	Frederick Hilley.....	48.04	" 196 Tex.	23rd Oct., "
Rio Tinto.....	".....	B. C. Exploring Synd., Ltd.....	33.80	" 257 R. 1	8th Dec., "
Susan.....	".....	A. St. G. Hamersley.....	43.80	" 23 G.	19th Apr., "
Sturt Bay No. 1...	".....	John J. Palmer.....	40.80	" 158 Tex.	18th " "
Sturt Bay No. 2...	".....	".....	51	" 159 "	18th " "
Sturt Bay No. 3...	".....	".....	35	" 160 "	18th " "
Sturt Bay No. 4...	".....	".....	50.02	" 161 "	18th " "
Vulcan.....	".....	Samuel M. Robins.....	27.55	" 48 G.	22nd Mar., "
Victoria.....	".....	A. St. G. Hamersley.....	50.92	" 21 "	19th Apr., "
Wellington.....	".....	Wm. A. Bauer.....	48.73	" 289 R. 1	19th May, "
Waterloo Fraction.	".....	".....	37.99	" 290 "	19th " "

COAST—NEW WESTMINSTER.

Silver King.....	N. Westm'er	Chas. Hayward.....	47.70	Lot 181, Tex.	24th Oct., 1899
White Star No. 1..	"	Florence A. Wauchope.....	51.65	" 1787, G. 1	28th July, "
White Star No. 2..	"	Adelaide Ewen.....	50.61	" 1788 "	28th " "
White Star No. 3..	"	A. McAdam.....	13.14	" 1789 "	2nd Aug., "
White Star No. 4..	"	Wm. Murray.....	27.38	" 1790 "	28th July, "
White Star No. 5..	"	Alexander Ewen.....	26.67	" 1791 "	29th " "

COAST—VICTORIA.

Alliance Fractional	Victoria....	Mt. Sicker & B. C. Dev. Co., Ld.	13	Lot 59, G...	16th June, 1899
Belle.....	".....	".....	49.26	" 55 "...	13th " "

COAST—VICTORIA.—*Concluded.*

Name of Claim.	District.	Name of Grantee.	Acres.	Description.	Date of Grant.
Chemainus	Victoria	Mt. Sicker & B. C. Dev. Co., Ltd.	48.50	Lot 34, G . . .	15th June, 1899
Ivy Fractional	"	" "	5.98	" 58 " . . .	16th " "
International Frac'l	"	" "	6.50	" 60 " . . .	16th " "
Lenora	"	" "	51.65	" 35 " . . .	13th " "
Shakespeare	"	" "	50.50	" 27 " . . .	16th " "
Struan	"	Duncan Stewart	35	" 81 " . . .	20th Nov., "
Struan	"	"	14.20	" 81 " . . .	20th " "

GOLD COMMISSIONERS AND MINING RECORDERS.

Mining Districts and Divisions.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-Recorder.
Cassiar District.....	Telegraph Creek..	James Porter .....	.....
Stikine River .....	" .....	.....	James Porter.....	
Liard " .....	" .....	.....	" .....
Sub-office	McDame Creek....	.....	.....
Teslin Lake.....	Telegraph Creek..	.....	" .....
Atlin District.....	Atlin	J. D. Graham .....	.....
Atlin Lake.....	" .....	.....	E. W. Biekle	
Bennett Lake	Bennett .....	.....	T. DesBrisay.....	
Skeena District.....	Victoria	W. S. Gore .....	.....
Skeena River	Fort Simpson .....	.....	John Flewin	
Sub-office	Hazelton .....	.....	.....	R. S. Sargent.
Bella Coola	Victoria .....	.....	W. S. Gore	
Omineca District.....	Manson Creek....	F. W. Valleau .....	.....
Omineca.....	" .....	.....	F. W. Valleau	
Sub-office	Fort St. James .....	.....	.....	A. McNab.
"	Fort St. John .....	.....	.....	F. J. H. Bedson.
"	Tom Creek.....	.....	.....	Jos. Lyon.
Cariboo District.....	Barkerville	John Bowron.....	.....
Cariboo.....	" .....	.....	John Bowron.....	
Quesnel.....	Quesnel Forks.....	.....	J. Murphy	
Lillooet District.....	Clinton	F. Soues.....	.....
Clinton.....	" .....	.....	F. Soues.....	
Lillooet.....	Lillooet.....	.....	C. Phair.....	
Kamloops District.....	Kamloops.....	G. C. Tunstall.....	.....
Kamloops.....	" .....	.....	M. Beattie.....	
Sub-office	Nicola .....	.....	.....	J. D. Lauder.
Ashcroft.	Ashcroft.....	.....	J. W. Burr	
Similkameen	Princeton .....	.....	H. Hunter.....	
Sub-office	Nicola .....	.....	.....	J. D. Lauder.
Yale	Yale .....	.....	Wm. Dodd	
Vernon District.....	Vernon	L. Norris .....	.....
Vernon .....	" .....	.....	J. C. Tunstall.....	
Boundary District	Fairview	C. A. R. Lambly .....	.....
Osoyoos .....	" .....	.....	J. R. Brown	
Kettle River.....	Greenwood.....	*W. G. McMynn	W. G. McMynn....	
Sub-office	Westbridge .....	.....	.....	J. S. Harrison.
"	Vernon .....	.....	.....	J. C. Tunstall.
Grand Forks	Grand Forks	*S. R. Almond	S. R. Almond	
Golden District	Golden	J. E. Griffith.....	.....
Golden .....	" .....	.....	F. C. Lang.....	
Windermere	Windermere .....	.....	G. Goldie.....	
Fort Steele District.....	Fort Steele	J. F. Armstrong... ..	.....
Fort Steele.....	" .....	.....	L. W. Patmore....	
Sub-office	Tobacco Plains .....	.....	.....	M. Phillipps.
"	Fernie .....	.....	.....	Robert Bullick.
"	Cranbrook .....	.....	.....	F. R. Morris.
Revelstoke District.....	Revelstoke	H. N. Coursier.....	.....
Revelstoke.....	" .....	.....	Fred. Fraser	
Illecillewaet	Illecillewaet .....	.....	W. Scott	
Lardeau	Comaplix .....	.....	Geo. Sumner	
Trout Lake	Trout Lake .....	.....	Alex. McRea.....	

GOLD COMMISSIONERS AND MINING RECORDERS.—*Concluded.*

Mining Districts and Divisions.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-Recorder.
Slocan District				
Slocan	New Denver	* <i>Angus McInnes</i>	Angus McInnes	
Slocan City	Slocan City	* <i>H. P. Christie</i>	H. P. Christie	
Nelson District	Nelson	John A. Turner		
Nelson	"		Harry Wright	
Goat River	Kuskonook		E. N. Murphy	
Ainsworth	Kaslo		* <i>D. C. Kurtz</i>	
Sub-office	Howser			Jno. Simpson.
"	Trout Lake			Alex. McRae.
Arrow Lake	Nakusp		F. G. Fauquier	
Sub-office	Vernon			J. C. Tunstall.
Rossland District	Rossland	John Kirkup		
Trail Creek	"		H. R. Townsend ..	
Nanaimo District	Nanaimo	Marshal Bray		
Nanaimo	"		Marshal Bray	
Alberni District	Alberni	Thos. Fletcher		
Alberni	"		Thos. Fletcher	
West Coast V. I.	Clayoquot		W. T. Dawley	
Victoria District	Victoria	W. S. Gore		
Victoria	"		W. S. Gore	
New Westminster	New Westminster		D. Robson	
Sub-office	Harrison Lake ..			L. A. Agassiz.

* Acting.

DECISIONS

Of the Geographic Board of Canada, relating to Geographic Names in British Columbia.

By Order in Council dated December 18th, 1897, the Governor-General in Council was pleased to create a "Geographic Board," and was further "pleased to order and direct that all questions concerning geographic names in the Dominion which arise in the departments of the public service shall be referred to the Board, and that all departments shall use in their publications the names and orthography adopted by the Board."

The following are decisions of the Board relating to names in British Columbia, as taken from the first Report of the Board, supplemented by certain other decisions since rendered:—

ALSEK river; in north-west part of Cassiar district, B. C.	EAGLE crag; mountain near Stikine river, north of Iskut river, Cassiar, B. C.
ANUK river; tributary to Stikine river, Cassiar, B. C.	EAGLE river; tributary to Dease river, Cassiar, B. C.
ANVIL mountain; near chain of lakes, Dease river, B. C.	EGNELL creek, post and hill; Sheslay river, Cassiar, B. C. (Not Egnelle nor Egnelle's.)
ARTHUR SEAT; mountain near Nahlin river, Cassiar, B. C. (Not Arthur's Seat.)	ELBOW mountain; at bend in lower part of Stikine river, Cassiar, B. C.
ATLIN lake; Cassiar, B. C., and Yukon.	GLAVE, Mount; near upper waters of Chilkat river, Cassiar, B. C.
ATLIN river; Atlin lake, Cassiar, B. C.	GLENORA; town on Stikine river below Telegraph Creek, Cassiar, B. C.
BEADY creek; near outlet of Dease lake, Cassiar, B. C.	GORDON, Mount; near Stikine river, south of Telegraph creek, Cassiar, B. C.
BEAR creek; tributary to Klondike river, B. C.	GUN lake; north of Nahlin river, Cassiar, B. C.
BEAVER lake, south of Atlin lake, Cassiar, B. C.	HACKETT river; tributary to Sheslay river, Cassiar, B. C.
BENNETT, Lake; B. C. and Yukon.	HALL river; Teslin lake, Cassiar, B. C.
BERNARD, Lake; south of Lake Bennett, Cassiar, B. C.	HAROLD, Mount; on lower part of Stikine river, Cassiar, B. C.
BLACK creek; tributary to Sloko river, Cassiar, B. C.	HARTZ creek; tributary to Tahltan river, Cassiar, B. C.
BLUE river; tributary to Dease river, Cassiar, B. C.	HATCHAU lake; Hackett river, Cassiar, B. C. (Not Macha.)
BURNT hill; near Nahlin river, Cassiar, B. C.	HATIN lake; near upper part of Koshin river, Cassiar, B. C.
CANYON creek; Dease river, near Dease lake, Cassiar, B. C.	HAYES river and peak; Teslin lake, Cassiar, B. C.
CANYON lake; south of L. Lindeman, Cassiar, B. C. (Not Deep lake.)	HEART mountains; east of Sheslay river, Cassiar, B. C.
CASSIAR district; a subdivision of British Columbia.	HOMAN river; at south end of Lake Bennett, Cassiar, B. C.
CHILKAT inlet, lake and river; north of Lynn canal, Cassiar, B. C. (Not Chilcat.)	HOTALUH mountains; between Stikine and Tanzilla rivers, Cassiar, B. C.
CHILKOOT inlet, lake and pass; north of Lynn canal, Cassiar, B. C. (Not Chilcoot nor Chilent.)	HUTSIGOLA lake; south of Teslin lake, Cassiar, B. C. (Not Hutsigola.)
CHIKOIDA mountain and river; Nakina river, Cassiar, B. C.	HYLAND hill; east of Hutsigola lake, Cassiar, B. C.
CHISMAINA lake; southeast of Teslin lake, Cassiar, B. C.	ICE-CAP mountain; on lower part of Stikine river, Cassiar, B. C. (Not Ice-Capped mountain.)
CHOQUETTE bar; in Stikine river, north of Iskut river, Cassiar, B. C. (Not Choquette's.)	INKLIN river; tributary to Taku river, Cassiar, B. C.
CLEARWATER river; tributary to Stikine river, Cassiar, B. C.	JENNINGS river; near south end of Teslin lake, Cassiar, B. C. (Not Fifteen-mile.)
CONE mountain; near Stikine river, north of Scud river, Cassiar, B. C.	KAHA creek; tributary to Koshin river, Cassiar, B. C. (Not Kahak.)
COPPER creek; Hackett river, east of Egnell, Cassiar, B. C.	KAHTATE river; tributary to lower part of Stikine river, Cassiar, B. C.
COTTONWOOD river; tributary to Dease river, Cassiar, B. C.	KAKETSA, Mount; south of Egnell, Cassiar, B. C. (Not Kotetsa.)
CRATER lake; south-west of Lake Lindeman, Cassiar, B. C.	KAKUCHUYA river; tributary to Dudidontu river, Cassiar, B. C.
DEASE lake and creek; Cassiar, B. C.	
DEFOT creek; branch of Canyon creek, Dease river, Cassiar, B. C.	
DOKDAON creek; tributary to Stikine river, near Clearwater river, Cassiar, B. C.	
DUDIDONTU river; near Sheslay river, Cassiar, B. C.	

- KASKAWULSH river; tributary to Alsek river, Yukon and B.C.
- KATES NEEDLE; mountain near Stikine river, opposite Porcupine creek, Cassiar, B.C.
- KATIN creek; tributary to Nakina river, Cassiar, B.C.
- KENNICOTT lake; at head of Hackett river, Cassiar, B.C.
- KETCHUM lake; north-east of Egnell, Cassiar, B.C.
- KLOOTCHMAN canyon; on Stikine river, south of Clearwater river; Cassiar, B.C. (Not Kluchman.)
- KOOTENAY lake, river, and district, B.C. (Not Kootenai nor Kootenie.)
- KOSHIN river; tributary to Nahlin river, Cassiar, B.C.
- KUTHAI lake; south-east of Atlin lake, Cassiar, B.C.
- LAKETON; post on Dease lake, Cassiar, B.C.
- LAURA, Mount; near lower Stikine river, north of Iskut river, Cassiar, B.C.
- LIARD river; tributary to Mackenzie river, B. C., Mackenzie, and Yukon. (Not Mountain river.)
- LINDEMAN, Lake; south of Lake Bennett, Cassiar, B. C. (Not Linderman nor Lyndeman.)
- LITTLE TAHLTAN river; tributary to Tahltan river, Cassiar, B.C.
- MCDAME creek; tributary to Dease river, Cassiar, B.C.
- MCGRATH, Mount; near lower part of Stikine river, north of Iskut river, Cassiar, B.C.
- MCLEOD, Mount; west of Dease lake, Cassiar, B.C.
- MARIA lake; north-west of Tuya lake, Cassiar, B.C.
- MATSATU river; tributary to Nahlin river, Cassiar, B.C.
- MIDDLE mountain; near lower part of Stikine river, south of Porcupine creek, Cassiar, B.C.
- MIDDLE creek; tributary to Tahltan river, Cassiar, B.C.
- MOOSE narrows; near south end of Teslin lake, Cassiar, B.C.
- MOUNTAIN lake; south-west of Lake Lindeman, Cassiar, B.C. (Not Long lake.)
- MUCHUYA creek; tributary to Kakuchuya river, Cassiar, B.C.
- NAHLIN river; tributary to Inklin river, Cassiar, B.C.
- NAKINA river; tributary to Taku river, Cassiar, B.C.
- NAKONAKE river; tributary to Sloko river, Cassiar, B.C.
- OBSERVATION butte; near Gun lake, north of Nahlin river, Cassiar, B.C.
- OMINECA river and district; Cariboo. (Not Omenica nor Ominica.)
- PERELESIIIN mountain; near Stikine river, between Anuk and Scud rivers, Cassiar, B.C.
- PIKE lake and river; south of Atlin lake, Cassiar, B.C.
- PORCUPINE creek; tributary to Stikine river, south of Anuk river, Cassiar, B.C.
- PORTER LANDING; at north end of Dease lake, Cassiar, B. C. (Not Porter's Landing.)
- QUARTZ creek; branch of McDame creek, Dease river, Cassiar, B.C.
- QUESNEL river and district, B.C. (Not Quesnelle.)
- QUESNEL FORKS; Quesnel river.
- ROBERTSON, Mount; near Stikine river, north of Iskut river, Cassiar, B.C.
- RUTH lake; west of Nakina river and south of Chikoida mountain, Cassiar, B.C.
- SADDLE mountain; near confluence of Stikine and Annk rivers, Cassiar, B.C.
- SAWBACK range; mountains west of Stikine river, Cassiar, B.C.
- SCUD river; tributary to Stikine river, Cassiar, B.C.
- SHAKES creek; tributary to Stikine river, south of Glenora, Cassiar, B.C.
- SHALLOW lake; between Bernard and Tutshi lakes, Cassiar, B.C.
- SHESLAY river; tributary to Inklin river, Cassiar, B.C.
- SLOCO lake and river; Cassiar, B.C. (Not Slocoh.)
- SNOW-CAP mountain; west of lower part of Stikine river, Cassiar, B.C.
- SNOWY mountain; east of Stikine river, near the elbow, Cassiar, B.C.
- STIKINE river; Cassiar, B. C. (Not Stickeen nor Stikeen, &c.)
- SUGARLOAF mountain; near Stikine river, north of Iskut river, Cassiar, B.C.
- SULLIVAN, Mount; west of Dease lake, Cassiar, B.C.
- SUMMIT lake; south of Lake Bernard, Cassiar, B.C.
- TAHLTAN lake and river—tributary to Stikine river; Cassiar, B.C.
- TAKU river; north-west Cassiar, B.C.
- TAKU arm; Tagish lake, Yukon and Cassiar, B.C.
- TANZILLA river; tributary to Stikine river, Cassiar, B.C.
- TATSHENSHINI river; tributary to Alsek river, Cassiar, B.C., and Yukon.
- TATSHO mountain; south of Dease lake, Cassiar, B.C. (Not Tacho.)
- TATSHO creek; tributary to Tanzilla river, Cassiar, B.C. (Not Eight-mile creek.)
- TATIKI bay; in Taku arm of Tagish lake, Cassiar, B.C. (Not Tatiki.)
- TAWINA river; east of Kuthai lake, Cassiar, B.C.
- TESLIN lake and river; in southern part of Yukon. (Not Hootalinqua nor Teslin-too.)
- THE KNOB; mountain near Stikine river, mouth of Iskut river, Cassiar, B.C. (Not Knob.)
- THIBERT creek; at north end of Dease lake, Cassiar, B. C.
- TROUT creek; branch of McDame creek, Dease river, Cassiar, B. C.
- TSETELUI lake; at head waters of Kakuchnya river, Cassiar, B. C. (Not Tseteloni.)
- TURNER, Mount; east of Stikine river and north of Iskut river, Cassiar, B. C.
- TUTESHETA creek; tributary to Tahltan river, Cassiar, B. C. (Not Tuteshita.)
- TUTSHI lake; south-east of L. Bennett, Cassiar, B. C. (Not Too-chi.)
- TUYA lake and river.
- WHIPPLE, Mount; east of the elbow of Stikine river, Cassiar, B. C.
- WHITE pass; at head of Skagway river, Cassiar, B. C.
- WHITESWAN river; flows into south end of Teslin lake, Cassiar, B. C.
- YETH creek; tributary to Inklin river, Cassiar, B. C.

INDEX.

A.

	PAGE.
<i>Aberdeen</i>	734
<i>Abbott Group</i>	684
Accidents in Collieries	836-840
Table of accidents occurring in B. C. collieries during 1899	836
Table shewing summary of accidents during the past ten years	837
Detailed statement of all accidents in 1899	838-39-40
Accidents in Metalliferous Mines	815, 816, 817, 818
<i>Acorn</i>	664
<i>Ada</i>	775
<i>Adair Group</i>	672
Addenda	Facing p. 549
<i>Admiral Dewey</i>	731
<i>Etna</i>	768
<i>Afton</i>	737
Aggregate summary of returns from Vancouver Island Collieries for year 1899	829
<i>Agnes</i> (Illecillewaet)	677
<i>Agnes</i> (Lardeau)	680
<i>Agnes Group</i>	675
Agricultural and Pastural Lands in Cariboo	615
<i>Ah Lum</i> Claim—Manson Creek	635
<i>Ah Quay</i> Claim	622
Ainsworth (or Hot Springs) Camp	696, 707
AINSWORTH MINING DIVISION	584, 693, 705
Adjustment of Boundaries	705
<i>Ajax</i> (Nanaimo)	807
<i>Ajax</i>	682
<i>Alabama</i> Claim (Mosquito Creek)	628
Alberni Canal	777, 778
Alberni and Coast—topography, geology, ore bodies, etc	778
ALBERNI DISTRICT	585, 777
Alberni Mining Division	585, 778, 784
West Coast Vancouver Island Mining Division	586, 786, 792, 794
<i>Alcyone</i>	698
<i>Alexandria</i>	689, 806
<i>Alfred</i>	776
<i>Alice Hay</i>	733
Alien Bill complications	644-45-46
Alki Creek	661
<i>Allan</i>	744
<i>Alma</i>	677
<i>Alma Group</i>	673
<i>Alma Mater Group</i>	748
<i>Alpha</i>	782
Alpha Bell Gold Quartz Mining Co	726
<i>Alpine</i>	742
<i>Alpine Fraction</i>	760
<i>Amazon</i>	700
<i>American Boy</i>	688
<i>American Wonder Group</i>	789, 793
<i>Anaconda Group</i>	675

	PAGE.
Anaconda Mining Co	648, 654
Analyses, Platinum Sand—Department of Mines	560
<i>Anchor</i>	765
<i>Anderson</i>	778
Anderson Lake, Alberni Mining Division. <i>Illustration</i>	Facing p. 790
<i>Anglo-Hibernian Group</i>	730
<i>Anglo Saxon</i> (Donald)	664
<i>Anglo Saxon</i> (Slocan)	688
<i>Annie</i>	677
<i>Annie L</i>	774
Antler Creek	622, 624, 625
<i>Antoine</i>	688
Arctic Slope Mining Co. of Victoria, B. C	635
<i>Arlington</i> (Slocan)	689
<i>Arlington</i> (Grand Forks)	760
Arrow Creek	693
ARROW LAKE MINING DIVISION	584, 709
<i>Arthur B.</i>	748
ASHCROFT MINING DIVISION	577, 745
Ashnola Creek	742
<i>Aspen Grove Group</i>	742
ASSAYING, EXAMINATION IN—DEPARTMENT OF MINES	561, 562, 563, 564
Bureau of Mines Act Amendment Act	561, 562
Report of Secretary of Board of Examiners	565
List of Assayers holding certificates	566
ASSAY OFFICE—Summary of year's work	559
Improvements	560
Melting of gold dust	559-60
ASSAYS AND SAMPLES, remarks on	566
Sampling—hints upon	567-68
Athabasca Gold Mines, Ltd	691
<i>Athens Group</i>	673
ATLIN DISTRICT	572
Atlin Lake Mining Division	572
Bennett Lake Mining Division	572
ATLIN LAKE MINING DIVISION	572, 644
Report by R. C. Lowry, M. E	650
Notes by J. C. Gwillim, B. A. Sc.	652
Atlin River	650, 651
Auriferous gravels of North Thompson River	735
<i>Aurora</i>	660

B.

Babine Valley coal deposits	819
<i>Bachelor No. 1 and No. 2</i>	747
<i>Badshot Group</i>	681, 685
<i>Bald Mountain Group</i>	664
<i>Baltimore Belle</i>	742
<i>Bank of England</i>	689
<i>Banner</i>	773
<i>Bannockburn Group</i>	685, 708
Barkerville Division	621
<i>Barnett Group</i>	689
<i>Barney</i>	787, 792
<i>B. C.</i>	761
B. C. Chartered Company, Limited	761
B. C. Copper Co	752
B. C. Development Co	727

	PAGE.
B. C. Exploring Syndicate.....	807
<i>B. C. Fraction</i>	761
B. C. Mine.....	761, 762
View of Mine. <i>Illustration</i>	Facing p. 774
B. C. Rossland and Slocan Syndicate, Limited.....	763
Bear Creek (Similkameen).....	740
Bear Creek (Ainsworth).....	708
Bear River.....	789
<i>Beatrice Group</i>	674, 678
Beatty Dredging Co.....	744
<i>Beaver</i>	807
Beaver Harbour.....	808
BELLA COOLA MINING DIVISION.....	573
<i>Belvidere</i>	782
<i>Belvidere Group</i> (West Coast).....	791
Ben d'Or Mines Co.....	725
<i>Ben Hur</i>	761
Bennett Lake.....	649
BENNETT LAKE MINING DIVISION.....	572, 649
Report by R. C. Lowry, M. E.....	650
<i>Bennison Group</i>	665
<i>Big Annie</i>	708
Big Bar (Fraser River).....	727, 728
<i>Big Bear</i>	782
Big Bend, The.....	669
<i>Big Chief Group</i>	659
<i>Big Copper</i>	767
<i>Big Four Group</i>	717
<i>Big Horn</i>	742
<i>Big Hump</i>	741
<i>Big Jam</i>	708
<i>Big Sioux Group</i>	739, 742
<i>Bill Nye</i>	731
Birch Creek.....	645, 649
<i>Birmingham</i>	656
<i>Bismark</i> (Grand Forks).....	755
<i>Bismark Group</i> (Pool Creek).....	673
Bitter Creek.....	656
<i>Black</i>	776
<i>Black Bear</i> (Lardeau).....	679
<i>Black Bear</i> (Fort Steele).....	661
<i>Black Beauty</i>	731
<i>Blackcock</i>	691
<i>Black Diamond</i>	674
<i>Black Diamond</i> (<i>Highlander</i>).....	696, 697
<i>Black Eagle</i>	716
Black Fox Mining Co.....	704
<i>Black Hawk</i>	775
<i>Black Hussar</i>	690
<i>Black Jack Claim</i> (Williams Creek).....	628
<i>Black Prince</i> (Vernon).....	747
<i>Black Prince</i> (<i>Chicora Group</i>).....	708
<i>Black Prince</i> (Slocan).....	689
Black Sand at Wreck Bay.....	786
<i>Black Warrior Group</i>	683, 708
Blackwater Camp.....	725
<i>Blakemore Group</i>	674
<i>Blue Bell</i> (Nanaimo).....	806

	PAGE.
<i>Bluebell</i> (Illecillewaet)	677
<i>Blue Bell Group</i> (Alberni)	782
Blue Bell Mine (Kootenay Lake)	699
<i>Blue Bird</i> (Kamloops)	731
<i>Blue Bird</i> (Grand Forks)	755
<i>Blue Grouse</i>	660
<i>Blue Jay</i> (<i>Nahmint</i>)	780
<i>Blue Jay</i> (<i>Castle Group</i>)	790, 792
<i>Blue Jay</i> (Vernon)	747
<i>Blue Jay</i> (Revelstoke)	670
<i>Blue Jay</i> (Kamloops)	738
<i>Blue Peter Group</i>	661
Blue Ridge Camp	707
<i>Blue Top</i> (<i>Galena Group</i>)	790
<i>Bonanza</i> (<i>Salmon River Group</i>)	733
<i>Bonaparte</i>	807
<i>Bon Diable</i>	747
<i>Boot Jack</i>	656
Boston and B. C. Copper Mining and Smelting Co.	671
Boston and B. C. Mining Co.	740
<i>Bosun</i>	688
Boulder Creek (Bennett Mining Division)	649
Boulder Creek (Atlin)	646, 649
Boulder Creek (Similkameen)	743
"Boundary Country"	750, 816
Ore bodies of, values, etc	750, 751
BOUNDARY (CREEK) DISTRICT	578, 750
Grand Forks Mining Division	579, 753
Kettle River Mining Division	579, 764
Osoyoos Mining Division	578, 772
<i>Bourke</i>	708
Boyd Creek	675, 679
Bradford, Yukon and Cariboo Gold Fields, Limited	624
<i>Bran</i>	682
Brandon and Golden Crown Mining Company	763
<i>Brett Group</i>	725
Brick	549, 828, 835
Bridge River	724, 725
<i>Britannia Group</i>	675
<i>Britannia Group</i> (Howe Sound)	810-11-12-13-14
Britannia Mining Company	698
British America Corporation	716
British Pacific Gold Property Company	789, 792
<i>Brooklyn</i>	771
<i>Brown Jug Group</i>	793
Brown's Camp	757
Brown's Creek	685
<i>Brunswick Group</i>	676
<i>Brutus</i>	791
<i>Buckthorn</i>	746
<i>Budweiser</i>	700
<i>Buena Vista</i>	809
Building Stone	549
Bulkley Valley Coal Deposits	819
<i>Bull Dog</i>	656
<i>Bullion Group</i>	775
Bull River	659
Bureau of Mines Act Amendment Act	561, 562

	PAGE.
<i>Burns Creek Group</i> (Cariboo Exploration Company)	627
Burns Mountain	632
Bute Inlet	807, 808
<i>Butte</i>	662

C.

Cadwallader Creek	725, 726, 727
<i>Caledonia</i> (Copper Creek)	737
<i>Caledonia</i> (Hardie Mountain Cinnabar Co.)	738
<i>Caledonia Group</i> (Atlin)	645
Caledonia Mining Co. of Nanaimo (Vital Creek)	636
<i>California</i> ..	688
California Consolidated Co	620
California Mine	717
California, U. S. A.—its sources of coal supply	831
Call Creek	808
<i>Calumet and Hecla</i>	689
Cameron District	808
Cameron Lake	807
Cameron Mining Co.	807
Camp Hewitt Mining and Development Co	748
Camp McKinney	772
Camp McKinney Development Co., Ltd	773
Camp McKinney Mines	773
Canadian-American Mining and Development Co	748
Canadian Creek	624, 628
<i>Canadian King</i>	748
Canadian Pacific Mining and Milling Co.	699
Canadian Pacific Railway	708
Canadian Smelting Co	751
Works at Trail. <i>Illustration</i>	Facing p. 750
Canyon Creek (placer mining)	665
<i>Carbonate Hill Group</i>	674, 679
<i>Cariboo</i> (Ainsworth) ..	708
<i>Cariboo</i> (Camp McKinney)	773
Cariboo Consolidated Co	620
Cariboo Consolidated Hydraulic Mining Co., Ltd., The	617, 618, 619
Flume. <i>Illustration</i>	Facing p. 574
Hydraulic Pit No. 1	574
Hydraulic washing with monitors. ..	590
Cariboo Consolidated, Ltd., Williams Creek	621, 622
“Cariboo Creek” Camp	709
Cariboo Deeps, Ltd., The	624
CARIBOO DISTRICT	574, 614
Cariboo Mining Division	574
Quesnel ..	575, 614, 629, 633
(Richfield Division) ..	614
(Barkerville “) ..	621
(Lightning Creek “) ..	621
Cariboo Exploration Co., Ltd., The	627
<i>Cariboo Fraction</i> (<i>Minne-ha-ha</i>)	773
Cariboo Gold Fields, Ltd., The	621
Cariboo Gold Lands, The	622
Cariboo-McKinney Gold Mining and Milling Co., Ltd	773
Cariboo Mining and Development Co., The	625
CARIBOO MINING DIVISION	574
Cariboo Mining Syndicate, The	620

	PAGE.
Cariboo Mountains	631
<i>Carlson</i>	708
Carnes Creek	671, 672
Carnes Creek Consolidated Co., Ltd	671
Carvell Creek	647
Cassiar Central Railway Co	654-55
CASSIAR DISTRICT	571, 643
Stikine River Mining Division	571
Liard " "	571
Teslin Lake "	571
(Atlin " ")	572, 644, 650, 652
(Bennett " ")	572, 649, 650, 652
(Skeena " ")	572, 655
Northern portion of Cassiar	654
<i>Castle Group</i>	790, 792
Cayoosh Creek	725
<i>Cedar</i> (Harper's Camp)	732
Cedar Creek	776
Central Camp	753
Centre Star Mine	715, 716, 815
Centre Star Mining Co	715
Certainty Gold and Mining Co., and <i>Certainty Group</i>	664
Certificates, Assay	566-67
<i>Champion</i> (<i>Pitt Lake Group</i>)	811
<i>Champion</i>	806
Channe Island	806, 808
<i>Chapleau</i>	689
<i>Charlotte</i> (<i>Kimberly Group</i>)	729, 730
Cherry Creek (Kamloops)	733
Cherry Creek (Fort Steele)	662
<i>Chestnut</i>	664
<i>Cheviot Group</i>	675
<i>Chickamon Stone Group</i>	659
<i>Chicora Group</i>	708
<i>Chieftain Group</i> (Arrow Lake)	709
<i>Chieftain Group</i> (Kamloops)	732
China Creek	778
<i>Christina</i>	760
<i>Cincinnati</i>	742
Cinnabar (Quicksilver)	738
Cinnabar Mining Company	738
City of Lincoln Mine	753
<i>City of Montreal</i>	754
City of Paris Gold Mining Company	753
City of Paris Mine	753
City of Paris and City of Lincoln Mines. <i>Illustration</i>	Facing p. 766
C. J. Seymour Baker Company	629
Claims, <i>Placer</i> (<i>see Placer Gold Mining</i>).	
" <i>Mineral</i> (<i>see Metalliferous Mining</i>).	
<i>Clara G. Group</i>	684
<i>Clara Group</i>	674
Clayoquot and District	778, 786
Clear Grit Real Estate Claim (Canadian Creek)	628
Clearwater River	736
<i>Cliff</i> (<i>Lime Cliff</i>)	703
<i>Cliff</i> (Bear Creek)	708
Climatic conditions	637, 654
<i>Climax</i>	708

	PAGE.
CLINTON MINING DIVISION	575
<i>See</i> Lillooet District	724
Coal	555, 728, 819
Statistics	549, 550, 554, 555, 820, 821, 829, 830
Specimens sent to Paris	590, 593, 605, 608
Coal Creek Colliery	819, 820, 822
Coal Hill Camp	729
Coal Mines (<i>see</i> Coal Mining in the Province)	819
Statistics of Output, Labour, Wages, etc.	820, 821, 829, 830
Inspectors' Reports	828
Collieries of Vancouver Island (list)	828
COAL MINING IN THE PROVINCE	819
Babine and Bulkley Valleys	819
Crow's Nest Pass	819 to 828
Vancouver Island	828 to 835
COAST AND VANCOUVER ISLAND	777
Topography, Geology, Ore Bodies, etc.	777, 778
Copper Output	557
Cobeldick Dredging Company	728
Dredge No. 1 in course of construction, Fraser River, Lytton. <i>Illustration</i> facing p.	742
<i>C. O. D.</i>	767
Coffee Creek	707
<i>Coin.</i>	688
Coke	549, 550, 554, 555
Statistics	555, 822, 831
Coke Ovens at Fernie, Fort Steele Mining Division, E. Kootenay. <i>Illustration</i> facing p.	822
<i>Colby</i>	708
COLLIERIES (<i>see</i> Coal Mining)	819
Colonial Mines Development Company of Canada, Limited	623
Columbia and Kootenay Mine	715, 716
Columbia and Western Railway	734, 739, 750, 751, 756
Columbia Gold Mining Company, The	629
Columbia River Bridge	663
Commission, Special, to adjust Atlin disputes	643
Commonwealth Mining and Development Company	683
Comox District	808
Companies working in Cariboo, list of principal	616, 617
<i>Comstock Group</i>	675
<i>Concentrator</i>	708
<i>Condor</i>	688
Conklin's Gulch	622
<i>Conmore and Lucky Jack Group</i>	676
Consolation Diggings	670
<i>Consol Group</i>	673
<i>Consolidated Alberni Group</i>	796
Construction Work on Pine Creek, estimate of	645
<i>Conwall</i>	748
Copper	556, 737, 738
Statistics	549, 550, 551, 552, 556
<i>Copper (Galena Group)</i>	790
<i>Copper Bench</i>	741
Copper Camp	767
<i>Copper Chief</i> (Similkameen)	742
<i>Copper Chief Group</i> (Trout Lake)	686
<i>Copper Cleft</i>	742
Copper Creek Development Syndicate	737
Copper Creek (Kamloops)	737
Copper Creek (Kettle River)	766

	PAGE.
<i>Copper Crown</i>	677
<i>Copper Farm Group</i>	741
<i>Copper Hill</i>	677
Copper Island Claims	784, 796
<i>Copper King</i> (Kennedy Mountain)	741
<i>Copper King</i> (Cherry Creek)	729, 733
<i>Copper King</i> (Copper Mountain)	741
<i>Copper King</i> (Osoyoos)	776
<i>Copper King Group</i> (Scott Creek)	676
<i>Copper King Group</i> (Trout Creek)	686
Copper Mountain	741
<i>Copper Queen</i> (Skeena)	656
<i>Copper Queen</i> (Vernon)	746
<i>Copper Queen</i> (Kettle River)	768
Copper Queen Mine, Texada Island	800, 802, 805
<i>Copper Reef</i>	741
<i>Copper Ridge Group</i>	666
<i>Corinth</i>	688
<i>Cornell</i>	801, 802, 805
Cornish Creek	628
Cornish Creek Enterprise, The	628
<i>Cornishman</i>	676
<i>Corona</i>	790, 792
Cottonwood Alluvial Gold Mining Company	629
Cottonwood River	629
<i>Cowboy</i>	738
<i>Coxey</i>	717
Cracroft Island	807, 808
Cranbrook	660
Crawford Creek Camp	707
<i>Crescent</i>	707
Criss Creek	736
<i>Cromwell</i> (Pitt Lake)	811
<i>Crow Group</i>	788
Crown Grants issued during 1899, List	841 to 852
<i>Crown Prince Group</i>	804
<i>Crown Silver</i> (<i>Sunset</i>)	767
Crow's Nest Pass Collieries	660, 819, 820, 821
Description of Mine, Plant, etc	822 to 827
Inspector's Report	828
Coke Ovens, Fernie, <i>Illustration</i>	Facing p. 822
Electric Trolley charging Coke Ovens. "	" 830
Trip of Mine Cars, No. 1 Tunnel, "	" 830
Crow's Nest Pass Coal Company	819 to 828
<i>Cuba</i>	708
Cuba Silver Mining Company	806
Cumberland Mining Company	686
<i>Curlew and Parrot</i>	717
<i>Cyclone</i> (<i>Navy Group</i>)	731
D.	
<i>Daffodil Group</i>	675
<i>Daisy</i> (Skeena)	657
<i>Daisy</i> (Ainsworth)	704
<i>Daisy Fraction</i> (Grand Forks)	761
<i>Dakota</i> (<i>Truth</i>)	730
Dalton Trail	649

	PAGE.
Dancing Bill Gulch	617
<i>Dandy</i>	748
<i>Dardanelles Group</i>	659
<i>Dayton</i>	774
Deadwood Camp	765
DeBeaux	778
Deer Creek	787
<i>Della</i>	708
<i>Delmonico (Galena)</i>	790
<i>Delos</i>	667
<i>Delphine Group</i>	666
<i>Denero Grande (Jewel)</i>	764
<i>Densy Group</i>	746
DEPARTMENT OF MINES	559
Work of the year	559
Provincial Mineralogist	559, 588
Examinations for Assayers	561 to 566
Mineral exhibit and photographic work for Paris Exhibition ..	559, 560, 587, 591, 612, 613
Assay Office, year's work	559
Melting and assay of gold dust, and improvements in laboratory ..	560
<i>Derby</i>	760
Derby Lease (Big Bar)	724
Decisions of Geographic Board relating to names in B. C.	855
Development and production of Mining Districts	558
Devil's Lake Gold Mining Co	627
Dewdney Syndicate	743, 793
<i>Diamond C. Group</i>	666
Diorite Basin	659
<i>Discovery (Mosquito Creek)</i>	628
<i>Discovery, Pine Creek, Atlin. Illustration</i>	Facing p. 654
<i>Discovery (Skeena)</i>	657
<i>Discovery Claim (Col. Mines Dev. Co.)</i>	623
DIVISIONS AND DISTRICTS:	
Readjustment of	569
Mineral production of each (Tables)	550, 552
Dixie Creek	649
<i>Doctor L. (Dr. L.)</i>	748
Dog Creek	727
<i>Dolphin (Camp McKinney)</i>	774
<i>Dolphin (Lower Keremeos)</i>	775
<i>Dominion</i>	775
Dominion and Spruce Creeks, Atlin—Col. Creighton's Hydraulic. <i>Illustration</i> ..	Facing p. 666
Dominion Consolidated Mines Co	775
Dominion Copper Co.	771
Dominion Gold Dredging Co.	728
<i>Donahue Group</i>	656
<i>Donald</i>	677
DONALD MINING DIVISION	663
Doratha Morton Mine	798, 799, 800, 806
<i>Double Crown Claims</i>	785
<i>Douglas Pine</i>	807
Downie Creek	671
<i>Drayon</i>	667
Dredging for Gold	556, 629, 633, 727, 743, 745
<i>Dry Hill</i>	657
<i>Ducette Boudrier Group</i>	674
Duck Creek	693
Duncan-Lardo Railway	695

	PAGE.
Duncan Mines Co.....	748
Duncan River.....	683, 695, 708
Duncan River Co-operative Mining Co.....	684
Dundas Island.....	656
Dundee Gold Mining Co.....	691
Dundee Mine.....	713
Dunsmuir District.....	808
<i>Duntellum</i>	807
<i>Dunvegan</i>	677
<i>Dupont Group</i>	659
Dutch Hill Lease.....	724

E.

<i>Eagle (Highlander)</i>	697
<i>Eagle King</i>	738
Earthquake Consolidated Gold Mining Company.....	757
Earthquake Mine and <i>Earthquake Group</i>	757, 758
Mine Cabin. <i>Illustration</i>	Facing p. 766
East River.....	708
<i>Echo (Elkhorn)</i>	775
<i>Echo (Ainsworth)</i>	708
<i>Eclipse Group (Alberni)</i>	785
<i>Eclipse Group (Revelstoke)</i>	674
<i>Eden</i>	707
<i>Edinburgh</i>	677
<i>Edna</i>	684
Eight-Mile Creek.....	686
Electric Trolley charging Coke Ovens, Fernie. <i>Illustration</i>	Facing p. 830
<i>Elizabeth</i>	677
Elizabeth Island.....	656
<i>Elkhorn Group</i>	775
Elk River, West Coast Vancouver Island Mining Division. <i>Illustration</i>	Facing p. 798
<i>Ellsmere Group</i>	683
<i>El Progresso</i>	737
<i>Elsie</i>	732
<i>El Ultimo</i>	738
<i>Emily Edith</i>	688
<i>Emma</i>	656
<i>Empire (Fort Steele)</i>	660
<i>Empire Group</i>	685
Empire Mines of B. C.....	685
<i>Empire No. 2</i>	734
<i>Empress</i>	746
<i>Enterprise (Kettle River)</i>	765
Enterprise Mine.....	690
Erickson Colliery.....	819
<i>Erin</i>	730
Errata.....	Facing p. 549
<i>Estella Group</i>	659
<i>Estelle</i>	674
<i>Ethel Group</i>	686
<i>Eulie Group</i>	674
<i>Eureka Group</i>	672
<i>Eva (Lardeau)</i>	678
<i>Eva Group</i>	676
<i>Evans Claim (Manson Creek)</i>	635
<i>Evans Creek</i>	635
<i>Evening Star (Slocan)</i>	689

	PAGE.
<i>Evening Star</i> (Kamloops)	731
Evening Star Mine (Rossland)	715
<i>E. W. R.</i>	698
Examinations for Assayers	561
Excelsior Gold Mines, Limited	705, 706
<i>Exchange Fraction</i>	742
Exchequer Mine	691
<i>Extension (Lake Shore)</i>	783

F.

Fairfield Exploration Syndicate	806
Fairview Camp	774
Fairview Corporation, Limited	774
<i>Falcon</i>	747
<i>Falcon (B. C. Group)</i>	761
<i>Fententine</i>	758
Fernie	660
Coke ovens. <i>Illustration</i>	Facing p. 822
Electric trolley charging coke ovens. <i>Illustration</i>	" 830
Fern Mine	691
Findlay River	636
<i>Fir</i>	732
Fire clay and fire brick	555, 828, 835
<i>Fire Mountain Group</i>	810, 811
Fire Valley and Kettle River Districts	710
<i>Fisher Maid</i>	782
Fish Lake	776
Fish River	673, 677, 678
Five-mile Creek	686
Flat Creek	677
<i>Flathead Group</i>	683
<i>Flora</i> (Dominion Consolidated Mines)	775
<i>Flora (Good Hope)</i>	791
<i>Florence Fraction</i>	767
<i>Fontenoy</i>	774
Fontenoy Gold Mining and Milling Company	774
Foreign Markets for Vancouver Island Coal	831
Foreign Shipments of Coal (1899)	830
" " " (1898-1899) Summary	830
Forest of Douglas Fir, Vancouver Island. <i>Illustration</i>	Facing p. 670
<i>Forest Queen</i>	733
Forrest Company, The	657
FORT STEELE (S. E. Kootenay) DISTRICT	580
FORT STEELE MINING DIVISION	580, 658
<i>Forty Thieves Group</i>	726
Forty-third Mining and Milling Company	634
Flume construction. <i>Illustration</i>	Facing p. 630
Ditch. "	" 630
Ditch through bad ground. "	" 630
Main flume "	" 638
<i>Four Aces</i>	656
Four-mile Creek	659
Fourteen-mile Creek	626
<i>Fourth of July (4th July)</i>	768
<i>Fragment</i>	732
<i>Franklin Group</i>	674
<i>Fraser</i>	708
Fraser River	629, 724, 727, 743, 744, 745

	PAGE.
Fraser River Consolidated Gold Company	743
Frederick Arm	806, 807, 808
French Creek	670
French Creek Mining Company	670
Frezeno	679
G.	
Gainer Creek	684, 685
Galena Group	790
Gambler	746
Gem	746
GEOLOGY	651, 652, 653, 710, 726, 778, 794, 795, 796, 797
Georgie	677
Germansen Creek	634
Gertrude Mine	716
Gibson	705, 708
Gilfoil Group	725
Gisby	744
Glacial Action in Cariboo	631
Glacier (Trout Lake)	686
Glacier (Slocan)	708
Glacier Creek	695
Glacier Creek (Trout Lake)	686
Glacier Gertrude	686
Gladstone	748
Glasscap Group	682
Glengary Group	675, 683, 708
Glen Iron Mines	733
Glenside Group	683
Goat Creek	693
GOAT RIVER MINING DIVISION	584, 692
Golconda (Skeena)	656
Golconda (Osoyoos)	776
Gold (<i>see also</i> Gold Lode, Gold Placer, Dredging, and Hydraulic Mining)	556
Gold Commissioners and Mining Recorders	853-854
Gold Crown	741
Gold Drop (Jewel Group)	764
Gold Drop Fraction	771
Gold Drop Group	771, 772
Gold Drop Mining Company	771
Gold Dust, Melting and Assay—Department of Mines	560
Golden Cache Company	725
Golden Cache Mine	725
Golden Chest	731
Golden Crown Fraction (Minne-ha-ha)	773
Golden Crown (Alma Mater)	748
Golden Crown (Castle Group)	790, 792
Golden Crown (Grand Forks)	763
Golden Crown (Skeena)	656
GOLDEN (N.E. KOOTENAY) DISTRICT	580, 663
Golden Mining Division	580, 664
Windermere "	580, 666
(Donald ")	663
Golden Eagle Group	758
Golden Eagle (Kettle River)	771
Golden Eagle (Alberni)	779, 785
Golden Ears Group	810
Golden Fleece Group	659

	PAGE.
<i>Golden Hope (Belvidere)</i>	791
GOLDEN MINING DIVISION	580, 664
Golden Province Mines Company	629
Golden River Quesnel Company, The	620
<i>Golden Rule Nos. 1 and 2</i>	785
<i>Golden Slipper Group</i>	785
<i>Golden Star</i>	732
<i>Golden Sunbeam</i>	746
<i>Golden Tarry</i>	748
Gold Hills Exploration and Development Company	686
Gold Lode—Statistics	549, 550, 551, 552, 556
Gold Placer (<i>see also</i> Placer Gold Mining)—Statistics	549, 550, 551, 552, 556, 745
List of Specimens sent to Paris	609
Gold Queen Mining Company	744
Gold Range Mountains	631
<i>Gold Ridge</i>	807
Gold Run Creek	650
<i>Goldsmith Group</i>	813, 814
<i>Gold Standard</i>	774
Gold Tax (Atlin Returns)	649
<i>Good Hope Group (Helga Group)</i>	791, 793
<i>Gordon</i>	732
<i>Grace C.</i>	684
Granby Consolidated Mining and Smelting Company	752, 768
GRAND FORKS MINING DIVISION	579, 753
Grand Forks, Town of, 1899. <i>Illustration</i>	Facing p. 758
Grand Forks Smelter	752
Grand Prairie	733
<i>Grand Republic</i>	695
<i>Grand Times</i>	747
<i>Granite (Camp McKinney)</i>	773
<i>Granite Creek (Similkameen)</i>	740
<i>Granite Creek (Alberni)</i>	781
<i>Granite Mine (Nelson)</i>	691
Grant and Omaha Smelting Company	697
<i>Grass Roots</i>	731
<i>Great Expectation</i>	783
Great Northern Mountain	682
Great Western Mine	716
<i>Green Cub</i>	732
<i>Green Idol</i>	708
<i>Green Mountain</i>	776
Greenwood Smelter	752
<i>Grey Eagle</i>	738
Gribbel Island	656
<i>Grizzly</i>	656
Ground Hog Basin	669
Grundy Basin	659
Guides. Rail—for Shafts	816
<i>Guildemai Group</i>	793
Guinea Gold Mines of B. C.	684
<i>Guyet</i>	622

H.

Hall Dredging Co.	630
Hall Mines Ltd.	691, 815
Hamill Creek	694

	PAGE.
<i>Hamilton Group</i>	689
<i>Hannah</i>	744
<i>Hanson Group</i>	796
Harbledown Island.....	808
Hardie Mountain Cinnabar Co.....	738
Harper's Camp.....	729
<i>Harper's Camp Group</i>	732
<i>Hartney</i>	688
<i>Harvey</i>	674
Hayes Mine (<i>See Nahmint</i>).....	779, 785
<i>Heather Bell</i>	718
<i>Hecla Group</i> (Revelstoke).....	672
<i>Hecla Group</i> (Kamloops).....	730
"Heinze Smelter".....	757
<i>Helen H. Gardner</i>	741
Helga Gold and Copper Mining Co.....	791, 793
<i>Helga Group</i> (<i>Good Hope Group</i>).....	791, 793
Helmcken Island.....	808
<i>Henrietta</i>	733
<i>Herringback</i>	677
Hesquoit.....	793
<i>Hettie Green Group</i>	788, 793
<i>Hewitt</i>	688
<i>Hidden Treasure</i>	747
<i>Highland Chief Group</i>	683
<i>Highlander</i>	696
Highlander Mill and Concentrator.....	697
Highlander Mining and Milling Co.....	696
<i>Highlander Tunnel</i>	696, 697
<i>Highland Group</i>	708
<i>Highland Mary</i>	676
<i>Hilda</i> (B. C. Mine).....	761
<i>Hill Top</i>	732
Hiwatches Creek.....	778
Hixon Creek.....	629
<i>Home Rule</i>	741
<i>Homestake</i> (Kamloops).....	732
<i>Homestake Group</i> (Glacier Creek).....	686
Homestake Mine (Rossland).....	717
<i>Homestead</i>	775
<i>Honey Suckle</i>	741
<i>Hope</i> (<i>Truth Group</i>).....	730
<i>Hope</i> (<i>Salmon River Group</i>).....	733
<i>Hopeful</i>	708
Horne Lake.....	807
Horne Lead.....	683
<i>Horsefly</i>	742
Horsefly Gold Mining Co., Ltd., The.....	620, 633
Horsefly Hydraulic Mining Co., Ltd., The.....	620
Stamp Mill for cemented gravel. <i>Illustration</i>	Facing p. 614
Horseshoe Bend (Thompson River).....	735
Horse Thief Creek.....	667
Hotham Sound.....	808
<i>Hot Punch</i>	666
Hot Springs (Ainsworth) Camp.....	696, 707
Howe Sound copper properties.....	812, 813, 814
Howser Lake and Creek.....	708
<i>Humber</i>	737

	PAGE.
<i>Humbolt</i>	741
<i>Humming Bird</i>	755, 756
<i>Humming Bird</i> (Kamloops)	734
Humming Bird Gold Mines, Ltd.....	755
<i>Hunter (Good Hope)</i>	791
<i>Hunter and Trapper Group</i>	673, 679
Hydraulic Mining	556, 617 to 629, 634, 635, 636, 645, 646, 647, 670, 724, 740, 743

I.

<i>Ida</i>	708
<i>Idaho</i>	771
<i>Ida May</i>	726
ILLECILLEWAET MINING DIVISION	581, 677
Illecillewaet River, North Fork of	677
<i>Imperial Fraction</i>	764
Imperial Gold Mining Company.....	684
<i>Imperial Group</i>	676
Incorporated Exploration Company of B. C.....	626
<i>Independence</i>	684
<i>Index</i>	674
<i>Indian Chief Group</i>	791, 793
INSPECTION OF COLLIERIES, 1899 REPORT	828
INSPECTION OF METALLIFEROUS MINES, 1899 REPORT	815
<i>International</i>	701
<i>Iona (Rathmullen)</i>	761
<i>Iona (Ainsworth)</i>	708
<i>I. O. U.</i>	746
<i>Iron Cap (Salmon River Group)</i>	733
<i>Iron Cap (Volcanic)</i>	758, 759
<i>Iron Chancellor</i>	731
<i>Ironclad Claims (Blue Bell)</i>	782
Iron Colt Mine.....	717
<i>Iron Dollar</i>	678
<i>Iron Duke (Similkameen)</i>	742
<i>Iron Duke Group (Coast)</i>	793
<i>Iron Hand</i>	708
<i>Iron Hill</i>	664, 665
<i>Iron King</i>	757
<i>Iron King (Elkhorn)</i>	775
<i>Iron Mask (Kamloops)</i>	730
Iron Mask Mine (Trail).....	715, 716, 815
Iron Mine (Texada)	805, 816
Iron Ore	557
Isaac Creek Camp	672
Island Mountain	632
<i>I. X. L. (Skeena)</i>	656
<i>I. X. L. (Lardeau Creek, South Fork)</i>	686
<i>I. X. L. (Similkameen)</i>	742
<i>I. X. L. Mine (Trail)</i>	715
<i>I. X. L. Group (Lardeau Creek)</i>	682
<i>I. X. L. Group (Lardeau Creek, North Fork.)</i>	683

J.

<i>Jack North</i>	806
<i>Jackson (Bluebell)</i>	782
Jackson Mine	707
Jamieson Creek	735, 736

	PAGE.
<i>J. C. Group</i>	686
<i>Jennie</i>	730
<i>Jennie Silkman</i>	741
Jervis Inlet	807, 808
Jewel Gold Mines, Ltd.	764
<i>Jewel Group</i>	764, 765
<i>Jingo Bird</i>	781, 785
<i>John Bull (Uncle Sam)</i>	784
<i>John L. (Fort Steele)</i>	659
<i>John L. Group (Trout Lake)</i>	687
<i>Johnson Bros. Group</i>	708
Johnston Strait	808
<i>Joker Group</i>	705, 706
Jordan Pass	672
Josie Mine	716
<i>Jubilee (Similkameen)</i>	741
<i>Jubilee (Lardeau)</i>	680
Jubilee Partnership Co	807
<i>Julia Anna</i>	748
<i>Jumbo (Fish River)</i>	677
<i>Jumbo (Trail)</i>	717
<i>Jumbo (Union Jack)</i>	685
<i>Jumbo (W. Coast)</i>	787, 792
Jumbo Mining Syndicate	787
"Jumping" and Alien Bill complications	643, 644, 645, 646
<i>Junction City (Golden Eagle)</i>	758
<i>J. W. (B. C. Mine)</i>	761

K.

<i>Kamloops</i>	774
KAMLOOPS DISTRICT (Yale District)	576, 729
Kamloops Mining Division	576, 729
Ashcroft "	577, 745
Similkameen "	577, 739
Yale "	577, 743
KAMLOOPS MINING DIVISION	576, 729
Kaslo, Ainsworth Mining Division, View from. <i>Illustration</i>	Facing p. 686
Kaslo River, South Fork	701, 706
<i>Kathleen Group</i>	748
Keithley Creek District	633
<i>Kenly</i>	741
Kennedy Mountain	739, 741
Kennedy River and Lake	787
<i>Kentish Maid Group</i>	675
Keremeos, Upper and Lower	775, 776
Kettle River	710, 776
KETTLE RIVER MINING DIVISION	579, 764
<i>Key</i>	733
Keystone Mountain and Creek	671
<i>Kilo Group</i>	689
<i>Kimberly Consolidated Group</i>	661
<i>Kimberly Group</i>	730
<i>King (Similkameen)</i>	742
Kingcome Inlet	807
<i>King Group</i>	744
King Mining Co.	762
<i>King Solomon (Kamloops)</i>	734

	PAGE.
<i>King Solomon</i> (Kettle River).....	768
<i>King Solomon</i> (Illecillewaet).....	677
<i>Kingston</i> (<i>Rollo, War Horse</i>).....	742
<i>Kingston Group</i> (Revelstoke).....	676
Kitamaat Arm.....	656
<i>Kitamaat Gem</i>	656
Kitsalas Camp.....	655
<i>Kitsap</i>	674
Klaoitsis Island.....	808
<i>Klondike</i> (Ainsworth).....	708
<i>Klondyke Group</i> (Vernon).....	746
Knights Inlet.....	807, 808
<i>Knob Hill and Old Ironsides Groups</i>	768, 769, 770
Knob Hill Gold Mining Co.....	768
Knob Hill Mine.....	768, 769, 770
Old Ironsides and Knob Hill Mines. <i>Illustration</i>	Facing p. 774
<i>Kootenay Chief</i>	675, 680
Kootenay (Perry Creek) Gold Mines, Ltd.....	660
Kootenay Lake and River.....	692, 693, 699, 710, 711, 712, 713
KOOTENAY, NORTH-EAST (Golden District).....	580, 663
(Donald Mining Division).....	663
Golden.....	580, 664
Windermere.....	580, 666
KOOTENAY, NORTH-WEST (Revelstoke District).....	581, 669
Revelstoke Mining Division.....	581, 669
Illecillewaet.....	581, 677
Lardeau.....	582, 678
Trout Lake.....	582, 680
KOOTENAY, SOUTH-EAST (Fort Steele District).....	580, 658
Fort Steele Mining Division.....	580, 658
<i>Kootenay Queen</i>	666
Kyuquot.....	793, 796

L.

Labour troubles.....	691, 706
<i>Lade Group</i>	684
<i>Lady S</i>	788
Laforme Creek.....	672
<i>Laird</i>	708
Lake Creek.....	686
<i>Lake Shore Group</i> (Kootenay).....	660
<i>Lake Shore Group</i> (Alberni).....	783, 784, 796
Natural arch of hornblende, Lake Shore Group. <i>Illustration</i>	Facing p. 790
Lanark Mine.....	678
Lane and Kurtz Co.....	626
Lardeau-Duncan River Camp.....	707
Lardeau Creek:	
North Fork of.....	683
South Fork of.....	685
<i>Lardeau Goldsmith Group</i>	673
<i>Lardeau King, Queen and Prince</i> (<i>Royal Group</i>).....	675, 679
LARDEAU MINING DIVISION.....	582, 678
Lardeau River Section.....	696
Lardo-Duncan Gold and Silver Mining Co.....	684
Lardo-Duncan Railway Co.....	708
<i>Last Chance</i> (Revelstoke).....	676
<i>Last Chance</i> (Kamloops).....	737

	PAGE.
<i>Laskay (Golden Eagle)</i>	758
<i>Laurier</i>	656
<i>Lavenah</i>	694
<i>Lavina</i>	708
<i>Lea</i>	791
<i>Lead</i>	557
Statistics	549, 550, 551, 553, 557
<i>Legal</i>	690
Legislative Buildings—Victoria, B.C. <i>Illustration</i>	FRONTISPIECE.
Lemon Creek	689, 690
Lemon Gold Mining Company	774
Lenora Mine	809, 816
Le Roi Mine, Rossland	715, 716, 815
Black Bear Compressor, Le Roi. <i>Illustration</i>	Facing p. 726
<i>Leschi</i>	791
Lewis Creek (Fort Steele)	659
Lewis Creek (Kamloops)	729
<i>Lexington</i>	674
Lexington Creek	674, 679
<i>Lexington Group</i>	754
<i>L. H.</i>	688
LIARD RIVER MINING DIVISION (Cassiar)	571
<i>Liberty (Lime Cliff, etc.)</i>	703
<i>Liberty Hill (Slocan-Liberty Hill)</i>	703
Lightning Creek	621, 622, 625, 631
Lightning Creek Gold Gravels and Drainage Company	625
<i>Lillian Group</i>	684
LILLOOET DISTRICT	575, 724
Clinton Mining Division	575
Lillooet "	576
LILLOOET MINING DIVISION	576
Lillooet Hydraulic Mining Co	724
<i>Lilly K</i>	757
<i>Lily Dale</i>	733
<i>Lime Cliff, etc., (Trust Mining Co.)</i>	703
<i>Little Bertha</i>	760
<i>Little Brother</i>	663
Little Cariboo Mining and Milling Co	774
<i>Little Donald (Highlander)</i>	696, 697
<i>Little Duncan</i>	746
<i>Little Gem</i>	741
<i>Little Phil</i>	696, 697, 707
<i>Little Robert Group</i>	683
Lode Mining	556
Production by, Table VI	551
Log Cabin, Bennett Mining Division. <i>Illustration</i>	Facing p. 654
<i>London Fraction</i>	761
<i>Lone Pine</i>	708
<i>Lone Star</i>	674
Long Lake Camp	764
<i>Lord of the Isles</i>	783, 784
<i>Lorindale</i>	806
Lorne Creek	657
<i>Lorne Group</i>	726
Lost Creek	635
<i>Lost Cup Group</i>	676
<i>Lost Tiger</i>	688
Loughborough Inlet	806, 807, 808

	PAGE.
<i>Louisa Fraction</i>	690
Lowhee Creek Claim	622
<i>Lucky Jack</i> (Ainsworth)	708
<i>Lucky Jack</i> (Lardeau)	680
<i>Lucky Jim</i>	686
<i>Lucky Strike</i>	742
Luke Creek	662
<i>Lulu</i>	742

M.

<i>Mabel Group</i>	686
<i>Madison</i>	688
<i>Maestro</i>	696
<i>Maggie M</i>	684
<i>Maid of England Group</i>	727
<i>Mainland</i>	740
Majestic Gold Mining Company	754
<i>Mamette</i>	738
Mamette Lake	738
<i>Mammoth</i>	774
Mansfield Camp	706
Manson Creek, Omineca	634-35
Town of Manson. <i>Illustration</i>	Facing p. 638
<i>Manxman</i>	676
<i>Maple Leaf</i> (Alberni)	779
<i>Maple Leaf</i> (Rathmullen)	761
Maple Leaf Mining and Development Company	707
Map of Vancouver Island	Facing p. 782
<i>Marble Bay</i>	804, 806, 816
Marble Bay Lime Kiln	804, 806
View of Lime Kiln. <i>Illustration</i>	Facing p. 814
Marble Mountains	727
<i>Marion</i>	688
Mark Creek	661
<i>Mary F</i>	748
<i>Mary Fletcher</i>	807
<i>Mascot</i>	717
<i>Massachusetts</i>	764
<i>Mastodon</i>	703
Maud Hydraulic Company, The	620
<i>May</i>	747
<i>Maybee</i>	682
May Creek	636
<i>May Flower Claim</i> (Tom Creek)	635
<i>McArthur</i>	708
McConnell's Camp	784
McCullough Creek	670
McCullough Creek Tunnel Company	670
McDonald Creek	683
McDougal Creek	675, 680
McGillavray Creek	725
<i>McIntosh Group</i>	660
McKay-Murphy Company	744
McKee Creek	647, 649
<i>McKenzie Fraction</i>	755
<i>McKinley</i>	656
McKinney, Camp	772, 816

	PAGE.
McKinney-Kamloops Mining Company	774
McKinnon Claims, Lost Creek	635
<i>McLean</i>	708
McRae Creek	675
<i>Meadow View</i>	748
Melting and Assay of Gold Dust, Department of Mines	560
Melvin Creek	647
Menhenick Creek	676
<i>Merry Eagle</i>	708
<i>Mersey</i>	737
Metalliferous Mines, Report of Inspector	815
Metalliferous Mining in Cariboo, Quesnel, Atlin, Lillooet, and Yale Divisions	631, 633, 648, 725, 744
Method of computing Mineral Production	549
Michel Creek Colliery	819
Midge Creek	692
<i>Midnight</i> (Kamloops)	734
<i>Midnight</i> (North Star Group)	661
<i>Mighty Dollar</i>	656
Mill Creek	734
<i>Miller Creek</i>	688
Mineral Claims (<i>see</i> Metalliferous Mining).	
Mineral Exhibit, Provincial, for Paris Exposition	587
Mineral Hill	676
<i>Mineral Hill Group</i>	748
<i>Mineral King</i>	666
Mineral Production of B. C.	549
Method of computing production	549
<i>Table I.</i> —Total production for all years up to and including 1899	549
<i>Table II.</i> —Production for each year from 1890 to 1899 (inclusive)	549
<i>Table III.</i> —Amount and value of mineral products for 1897-98-99	550
<i>Table IV.</i> —Production of metals by Districts and Divisions	550
<i>Table V.</i> —Yield of placer gold per year to date	551
<i>Table VI.</i> —Production of lode mines	551
<i>Table VII.</i> — " in detail, of the metalliferous mines for 1896-97-98-99	552, 553
<i>Table VIII.</i> —Coal and coke production per year to date	554
<i>Table</i> showing comparative mineral production for 1898, of B.C. and all other Provinces	589
<i>Table</i> showing mineral production of B. C. since 1852	Facing p. 558
Comparison of B. C. with Dominion production	588
Miner Graves Syndicate	768
MINING DIVISIONS	570, 571-586
Readjustment of Boundaries	569-70, 744
Principle adopted for defining Boundaries	569-70
Remote Districts, Deputy Mining Recorders in	570
Recording offices and sub-offices	570, 571-586, 853, 854
Mining statistics (Slocan Mining Division)	688
Minnie-ha-ha Gold Mining and Milling Co	773
<i>Minnie-ha-ha Group</i>	773
Minnesota Silver Co	688
<i>Minnie M.</i>	659
Miocene Gold Mining Co., Ltd., The	620, 633
Mohawk Creek	674
<i>Mohawk Group</i>	673, 679
Mollie Gibson Mine (Nelson)	691
<i>Mollie Gibson</i> (Kamloops)	732
<i>Mollie Hughes</i>	688
<i>Molly Mack Group</i>	685
<i>Monarch</i> (<i>Belvidere</i>)	791

	PAGE.
<i>Monarch</i> (Ainsworth)	704
<i>Monitor</i>	688
<i>Montana</i>	659
Monte Christo Mine (Trail)	715
<i>Monte Cristo</i> (Phillips Arm)	807
<i>Monte Group</i>	785
<i>Montezuma</i> (Kettle River)	771
<i>Montezuma</i> (Skeena)	656
Montezuma Mine and Concentrator (Ainsworth)	701, 702, 707
Montreal and British Columbia Mining Co., The	620
Montreal and Kootenay Mining Co	699
Montreal Boundary Creek Mining Co., Ltd	767
<i>Montrose</i>	744
Moorehead Creek	617
Moose Creek	647
<i>Morning</i>	742
<i>Morning Star</i>	708
Morrison Gold Mining Co.	766
Morrison Mine	766, 767
<i>Moscow Group</i>	673
Mosquito Creek	631
<i>Mother Lode</i>	765, 766
<i>Mound</i>	742
<i>Mountain Boy Group</i>	674, 679
<i>Mountain Chief Group</i> (Alberni). Mouth of incline. <i>Illustration</i>	Facing p. 806
<i>Mountain Group</i>	660
<i>Mountain Maid</i> (Klondyke Group)	746
<i>Mountain Queen</i>	748
<i>Mountain View</i>	734
Mount Sicker and B. C. Development Co	809
Moyie River and Lake	660
Museum, Mineral, Department of Mines	561

N.

Nahmint Mine (Hayes Mine)	779, 780, 781, 785
Nahmint Mining Co	780, 796
<i>Nahwitka</i>	784
<i>Naiad</i>	657
Names in B. C., decisions of Geographic Board	855
Nanaimo Colliery, returns, labour, etc.	832
Names of seams and pits, and descriptions of property	833
Newcastle Island shaft	833
NANAIMO DISTRICT	585, 798
Nanaimo Mining Division	585, 798
NANAIMO MINING DIVISION	585, 798
Nanoose District	808
<i>Native Silver Bell</i>	688
Natron Lakes	727
<i>Navy Group</i>	731
Needles Camp	709
<i>Neglected</i>	688
<i>Nellie Group</i>	674
<i>Nelly</i>	791
<i>Nelson</i>	733
<i>Nelson Creek Group</i> (Cariboo Exploration Co.)	627

	PAGE.
NELSON DISTRICT	583, 691
Nelson Mining Division	583, 691
Goat River "	584, 692
Ainsworth "	584, 693, 705
Arrow Lake "	584, 709
Nelson District:	
Geology	710
Copper output	557
Nelson District (Nanaimo)	808
NELSON MINING DIVISION	583, 691
<i>Neosha</i>	707
<i>Nettie L.</i>	682
<i>Nevada</i>	755
Newall Dredging Co.	630
Dredge cutting through bar, Fraser River. <i>Illustration</i>	Facing p. 622
Dredge in open water. <i>Illustration</i>	Facing p. 622
<i>Newark</i>	737
Newcastle District	808
Newcastle Island Mine	833
New England Dredging Co.	630
New Fraser River Gold Mines Co.	727
<i>New Last Chance</i>	757
New Mining Divisions. <i>See</i> Mining Divisions.	
<i>New Orleans</i>	708
NEW WESTMINSTER MINING DIVISION	586, 810
<i>New York (Seattle Group)</i>	789
<i>New York (Similkameen)</i>	742
<i>Nickel Plate Group (Similkameen)</i>	742
Nickel Plate Mine (Trail)	716
Nicola Valley	734, 819
<i>Night Hawk</i>	732
<i>Noewood</i>	708
<i>Nonsuch</i>	708
<i>Noonday and Curley</i>	688
<i>Noonday Group</i>	731
<i>Nora Group</i>	684
<i>Norman</i>	707
NORTH-EAST KOOTENAY. <i>See</i> Kootenay.	663
<i>North Star (Kettle River)</i>	765
<i>North Star (Illecillewaet)</i>	678
<i>North Star (Grey Eagle, Eagle King)</i>	738
<i>North Star (Skeena)</i>	656
North Star Branch Railway	661
<i>North Star Mine and Group (Fort Steele)</i>	661
North Thompson River, Auriferous gravels of	735
North-West Dredging Co. of Tacoma	629
NORTH-WEST KOOTENAY DISTRICT. <i>See</i> Kootenay.	669
<i>Not Known</i>	708
<i>Novelty Fraction</i>	761
<i>Nugget</i>	771
Nugget Gulch	624
Nugget Point, Pine Creek, Atlin. <i>Illustration</i>	Facing p. 646
Number of men employed in V. I. Collieries	829
<i>Number One (No. 1) (Boundary)</i>	755
<i>Number One (No. 1) Extension</i>	698
Number One Mine (Trail)	716
Number One (No. 1) Mine, Hot Springs Camp, Ainsworth	698, 707
View of mine. <i>Illustration</i>	Facing p. 702

	PAGE.
<i>Number Four (No. 4)</i>	753
<i>Number 2 (No. 2)</i>	748

O.

<i>Ocean Wave</i>	782
<i>Occidental (Quesnel River)</i>	629
<i>O'Donnell River</i>	647
<i>Office statistics</i> . . 632, 636, 648-49, 650, 657, 662, 663, 664, 666, 668, 672, 680, 687, 690, 692, 693, 709, 710, 718, 728, 739, 743, 744, 745, 749, 764, 772, 776, 786, 794, 808, 810, 812	
<i>O. K. (Pitt Lake)</i>	811
<i>O. K. Group (Kamloops)</i>	731
<i>Okalona</i>	785
<i>Okanagan</i>	747
<i>Old Abe</i>	659
<i>Old England</i>	774
<i>Old Gold Quartz and Placer Mining Co</i>	684
<i>Old Ironsides and Knob Hill Groups</i>	768, 769, 770
<i>Old Ironsides Mine</i>	768, 769
<i>Old Ironsides and Knob Hill Mines. Illustration</i>	Facing p. 774
<i>Old Ironsides Mining Co</i>	768
<i>Old Reliable</i>	686
<i>Old's Mountain</i>	710
<i>Old Timer</i>	704
<i>Omaha</i>	789
<i>Omineca Consolidated Co., Ltd</i>	634, 635
<i>OMINECA DISTRICT</i>	573, 634
<i>OMINECA MINING DIVISION (Land Recording District)</i>	573, 634
<i>Omineca River</i>	636
<i>Ophir (Lexington Creek)</i>	674
<i>Ophir and Ophir Co. (McCullough Creek)</i>	670
<i>Opulence</i>	775
<i>Opulence Mountain</i>	775
<i>Oread</i>	657
<i>Oregon Fraction</i>	754
<i>Oreole</i>	741
<i>Ormonde Group</i>	655
<i>Oro Denero</i>	762
<i>Orphan Boy</i>	782
<i>OSOYOOS MINING DIVISION</i>	578, 772
<i>Ottawa Hydraulic Mining Co</i>	743
<i>Otter Creek</i>	646, 649
<i>Otter Lake</i>	650
<i>Otto's Midget</i>	694
<i>Output of coal, 1898, 1899</i>	830
<i>Oyster Group</i>	676
<i>Owosso</i>	656

P.

<i>Pactolus, etc. (Pactolus Group)</i>	706
<i>Pactolus Gold Mines, Ltd</i>	706
<i>Paladora Group</i>	748
<i>Palmer's Bar Creek</i>	660
<i>Palouse</i>	705
<i>Pandre</i>	774
<i>Panorama</i>	746, 747
<i>Pansy</i>	778

	PAGE.
<i>Panther</i>	708
<i>Paradise Group</i>	666
<i>Paris</i>	742
PARIS EXHIBITION, 1900	587
Provincial Mineral Exhibit	587
Space allotments	587-88
Cases for specimens	590, 591
Placer gold specimens	590, 591
Photographic views	560, 591
List in full of all specimens and photos sent	592 to 613
Parsnip and Peace Rivers	614
<i>Pathfinder Group</i>	759
Pathfinder Mining Co	759
<i>Pauper</i>	732
<i>Pay Ore</i>	760
Pay Ore Mines, Ltd	760
<i>Pay Roll Group</i>	660
Peace River	614, 636, 819
<i>Pearl</i>	730
<i>Pedro Group</i>	687
<i>Peoitch</i>	747
Perry Creek (Kootenay) Gold Mines, Ltd	660
Peters Creek	625
Peters Creek Gold Mining Co	625
<i>Peterson</i>	684
<i>Philadelphia</i>	662
Philipps Arm	806, 807, 808
<i>Phillipsburg Fraction</i>	771
<i>Phil Sheridan</i>	757, 758
<i>Phœnix</i>	768
Phœnix (Town)	768
Photographic work (Department of Mines)	560
List of photos sent to Paris	612-13
Pilot Bay Smelter	699
<i>Pine</i>	732
Pine Creek, Atlin	644, 649
Nugget Point, Pine Creek. <i>Illustration</i>	Facing p. 646
"Discovery Claim."	" 654
Chinese pumps.	" 662
Mining scene.	" 662
<i>Pioneer</i>	726
<i>Pirate King Group</i>	674
<i>Pitt Lake Group</i>	811
Pittsburg and Cariboo Dredging Co.	630
Placer Gold. <i>See</i> Gold, Placer.	
Placer Gold Mining. (<i>See also</i> Hydraulic Mining and Dredging for Gold)	556, 614, 616, 636, 644 to 648, 650, 657, 659, 664, 665, 670, 724, 735, 739, 743, 745, 786, 789
Platinum	558
Statistics	553
Analysis of platinum sand (Department of Mines)	560
<i>Plymouth Queen</i>	734
<i>Pogue</i>	740
<i>Pole Star</i>	733
Polley's Lake	617
<i>Pontiac Group</i> (Pool Creek)	673
<i>Pontiac</i> (Ainsworth)	701
Pool Creek	673, 678
Poorman Mine	691, 815

	PAGE.
<i>Porcupine Group</i>	663
Porcupine Mountain.....	632
<i>Porphyry</i>	664, 665
<i>Portland</i>	717
<i>Porto Rico</i>	692, 713
<i>Possum</i>	732
<i>Pothook</i>	729, 730
<i>Potosi</i>	806
Powell Lake.....	808
<i>Prairie Mountain Group</i>	664
<i>Pretty Girl Group</i>	667
Prices of commodities in Cariboo.....	616
Primrose Gold Mining Co.....	684
<i>Prince Charles</i>	731
<i>Prince Group</i>	793
<i>Prince of Wales</i>	747
<i>Princess Alice</i>	733
<i>Princess May</i>	741
Production. (See Mineral Production of B. C.)	
Progress of Mining.....	555
Prospecting in Alberni District.....	777
<i>Providence Group</i>	810, 811
Provincial Mineralogist. Work of—Department of Mines.....	559, 588
Provisions in Cariboo, ruling prices.....	616
<i>Ptarmigan</i>	655
Puget Sound Iron Co.....	805, 806
Purvis Co.....	635
Pyramid Creek.....	661
<i>Python</i>	730

Q.

Quartz Creek Placer Mining.....	664
Quatsino District.....	778, 793, 797
Quebec and Boundary Gold Mining Co.....	756
Queen Bess Mine.....	688
Queen Charlotte Islands.....	819
<i>Queen Fraction</i>	688
QUESNEL MINING DIVISION.....	575, 614, 629, 633
Quesnel River.....	629
Quicksilver.....	738
Quilchena.....	734

R.

Rail guides.....	816
Railway construction.....	696, 708, 750, 751, 766
<i>Rainbow (Densy Group)</i>	746
<i>Rainbow (Slocan)</i>	689
<i>Ralph</i>	810
Ramsay Arm.....	808
<i>Ranger</i>	689
<i>Rathmullen Group</i>	761
Rathmullen Mining Co.....	761
<i>Raven</i>	682
<i>Raven Group (Texada)</i>	802, 805
<i>Rawhide</i>	771
Read Island.....	808

	PAGE.
Readjustment of Boundaries of Mining Divisions. (See Mining Divisions.)	
<i>Rebecca Fraction</i>	789
<i>Reco</i>	688
Recorders. (See Gold Commissioners.)	
Recording offices and sub-offices	570, 571 to 586
<i>Red Buck</i>	741
<i>Red Cloud</i>	708
<i>Red Line Group</i>	667
Redonda Island	808
<i>Reggie</i>	677
Remote Districts, Deputy Mining Recorders in	570
<i>Republic Group</i>	675
<i>Reveille</i>	761
<i>Revelstoke</i>	670
REVELSTOKE (North-West Kootenay) DISTRICT	581, 669
Revelstoke Mining Division	581, 669
Illecillewaet "	581, 677
Lardeau "	582, 678
Trout Lake "	582, 680
REVELSTOKE MINING DIVISION	581, 669
<i>Revenge Group</i>	675
<i>Revenue</i>	674
<i>Reward</i>	748
<i>Rex</i>	746
RICHFIELD MINING DIVISION	614
<i>Richmond</i>	760
<i>Rising Sun</i>	708
River dredging. (See Dredging.)	
Roads	659, 662, 663, 666, 668, 706, 713, 736, 754
<i>Roadside</i>	776
<i>Rob Roy</i>	683
Roche River	741
Rock Creek (Fort Steele)	659
Rock Creek (Osyoos)	774
<i>Rocket</i> (Pitt Lake)	811
<i>Rockland</i>	688
Rocky Mountains	631
<i>Rollo</i>	742
<i>Rose</i>	778
<i>Rosebery Group</i>	671
<i>Rosebud</i>	748
<i>Rose Group</i>	690
<i>Rose Marie Group</i>	787, 792
Open stope on Rose Marie vein. <i>Illustration</i>	Facing p. 798
Rose Marie concentrator. "	" 798
Rose Marie Mines, Ltd	787, 792
<i>Rossa</i>	708
Rossland, Town of. Main street, 1894. <i>Illustration</i>	Facing p. 718
General view, 1899 "	718
ROSSLAND DISTRICT	585, 715
Trail Creek Mining Division	585, 715
Rossland District, copper output of	557
<i>Rothschilds</i> (<i>Hettie Green</i>)	788
<i>Round Hill</i>	677
<i>Royal Canadian Group</i>	754
<i>Royal Group</i>	679
Royalty (Atlin returns)	649
Royal Victoria Mining Co	758

INDEX.

Ruby Creek	675
Ruby Silver Creek	808
Rupert District	686
<i>Rusty Axe</i>	688
Ruth Mine	

S.

Sable Creek	675, 680
<i>Sailor and Sailor Group</i>	772, 773
Sailor Consolidated Mining and Milling Company, Limited	772
<i>Salmon Arm Group</i>	733
Salmon River (Yale)	744
Salmon River (Nelson)	710, 711, 712, 713
<i>Salmon River Group</i>	733
Samples sent to Paris Exhibition, List of	592 to 611
Sampling	566, 567, 568
<i>Sampson</i>	731
Sand Creek	659
<i>San Juan</i> (Cariboo Consolidated, Limited)	622
San Juan Valley	809
<i>Sanquhar</i>	678
<i>Santa Cruz</i> (<i>Belvidere</i>)	782
<i>Sapphire</i>	688
<i>Sarita</i>	784, 796
<i>Saucy Lass</i>	732
Savonas and surrounding country	734, 736
Sayward District	808
<i>Scandinavian Claim</i> (Quesnel River)	629
<i>Schley</i>	731
<i>Scotia</i>	677
<i>Scotlett</i>	791
Scott Creek	676
Scottish Canadian Mining and Development Company	683
<i>Searchlight</i>	775
<i>Seattle</i> (Boundary)	754
Seattle Camp	754
<i>Seattle Fraction</i> (<i>Royal Canadian</i>)	754
<i>Seattle Group</i> (<i>New York</i>)	789, 790, 792
Seattle Mining Company	754
<i>Security</i> (Van Anda)	803, 805
<i>Shamrock</i>	775
<i>Shannon</i> (Kamloops)	738
<i>Shannon</i> (Shannon-Dolphin Company)	774
Shannon-Dolphin Gold Mining Company	774
<i>Sharon</i>	686
Sheep Creek	658
<i>Shiloh</i>	748
Shingle Creek	776
Shoal Bay	798, 806
Sicker, Mount	809
Sidney Inlet	791
Silver	557
Statistics	549, 550, 551, 552, 557
<i>Silver Bell Group</i> (Ainsworth)	704
<i>Silver Bell Group</i> (Trout Lake)	686
<i>Silver Belt Group</i>	681, 685
<i>Silver Bow</i> (Flat Creek)	677

INDEX.

	PAGE.
<i>Bow Group</i> (Lexington Creek)	674
<i>Silver Cable Group</i>	686
<i>Silver Cord</i>	686
<i>Silver Crown</i>	674
<i>Silver Cup Group</i>	681
<i>Silver Zollar</i>	674
<i>Silver Glance</i>	698
<i>Silver King Group</i>	748
Silver-Lead	557
<i>Silver Leaf Group</i>	684, 708
<i>Silver Plate</i>	686
<i>Silver Queen</i> (Great Northern Mountain)	682
<i>Silver Queen</i> (Duncan River)	684
<i>Silver Queen</i> (Ainsworth)	708
<i>Silver Queen</i> (Vernon)	747
<i>Silver Queen Group</i> (Arrow Lake)	709
Silver Queen Mining Company	709
<i>Silver Scepter</i> (<i>sic</i>)	733
<i>Silver Star</i>	680
Silver Star Mining Company	747
<i>Silver Thread Group</i>	667
<i>Silver Tip</i> (Similkameen)	742
<i>Silver Tip</i> (Ainsworth)	708
<i>Silver Tip Group</i> (Windermere)	666
<i>Silverton Bay</i>	686
SIMILKAMEEN MINING DIVISION	577, 739
Similkameen River	740, 742
Single log bridge over Canyon, West Coast V. I. <i>Illustration</i>	Facing p. 806
<i>Sitting Bull Group</i> (Lexington Creek)	675
<i>Sitting Bull Group</i> (Windermere)	667
Siwash Creek	744, 746
Six-Mile Creek	659, 660
Sixteen-Mile Creek (Similkameen River)	742
<i>Sixteen to One</i> (<i>16 to 1</i>)	703
SKEENA DISTRICT (Cassiar)	572, 654
Skeena River Mining Division	572, 655
Bella Coola	573
SKEENA RIVER MINING DIVISION	572, 655
Skeena River (coal)	819
Skirt Mountain	810
Skookum Chuck Creek	662
Skull Creek	735
<i>Skylark</i> (<i>Ranger</i>)	689
<i>Skyline</i>	742
Slate Creek	740
Slate Creek Mining Co.	740
Slocan-Cariboo Mining Co., The	628
SLOCAN CITY MINING DIVISION	583, 689
SLOCAN DISTRICT	582, 687
Slocan Mining Division	582, 687
Slocan City	583, 689
<i>Slocan-Liberty Hill Group</i>	703
SLOCAN MINING DIVISION	582, 687, 688
Slocan River, Lemon Creek	689-90
Springer Creek	689
Slocan Star Mine	688
Slough Creek	624-26-27
Smelting Works, Boundary District	751, 752
" Texada Island	803, 805

INDEX.

Smith Creek	574
<i>Smith Group</i>	775
<i>Smuggler</i>	775
Snake Creek	646
<i>Snowflake</i>	741
<i>Snowshoe</i> (Grand Forks).....	763, 764
<i>Snowshoe Group</i> (Trout Lake).....	686
Snowshoe Plateau	632
<i>Society Girl</i>	660
<i>Something Good</i>	776
SOUTH-EAST KOOTENAY DISTRICT. (<i>See Kootenay</i>)	658
<i>Southern Belle</i>	717
South Fork Camp (Kaslo River)	706
<i>Sovereign</i>	688
Special Commission (to adjust Atlin disputes)	643
Specimens sent to Paris, List of.....	592 to 611
Springer Creek	689
Spruce Creek and tributaries.....	646, 649
" Little	647
Col. Creighton's Hydraulic. <i>Illustration</i>	Facing p. 646
St. Anthony Company of Santa Barbara, Cal., The.....	634
<i>St. Elmo</i> (Yale)	744
<i>St. Elmo</i> (Trout Lake).....	683
<i>St. Elmo</i> (Trail)	716
<i>St. Eugene Group</i>	660
<i>St. Joe Group</i>	676
<i>St. Keverne</i>	688
<i>St. Lawrence</i>	708
<i>St. Louis</i>	690
St. Mary's Lake	661
St. Mary's Prairie and Waggon Road	662
St. Mary's River	660, 661
<i>Stag</i>	748
<i>Standard</i>	708
Standard Basin	671
<i>Standard Fraction</i>	771
<i>Standard No. 2</i>	755
<i>Star</i>	707
<i>Stars and Stripes</i>	703
Statistics. (<i>See Office Statistics</i>). of mineral output. (<i>See Mineral Production</i>). of Trail Creek and Slocan Mines.....	688, 715, 716, 717, 718
of coal output. (<i>See Coal Mines</i>)	
<i>Stella</i>	656
<i>Stemwinder</i> (Fairview Corporation)	774, 775
<i>Stemwinder</i> (Dominion Copper Co)	771
<i>Stemwinder</i> (Fort Steele).....	661
Stephendike Creek.....	646
Stephnie Branch (Sable Creek).....	676
<i>Sterling</i>	737
Stewart Island.....	807, 808
STIKINE RIVER MINING DIVISION (Cassiar District)	571
Stone, Building	549
<i>Strawberry</i>	756, 757
Stray Gulch	649
Students in Government Laboratory	560
<i>Sullivan Group</i>	661
Sullivan Hill.....	661

INDEX.

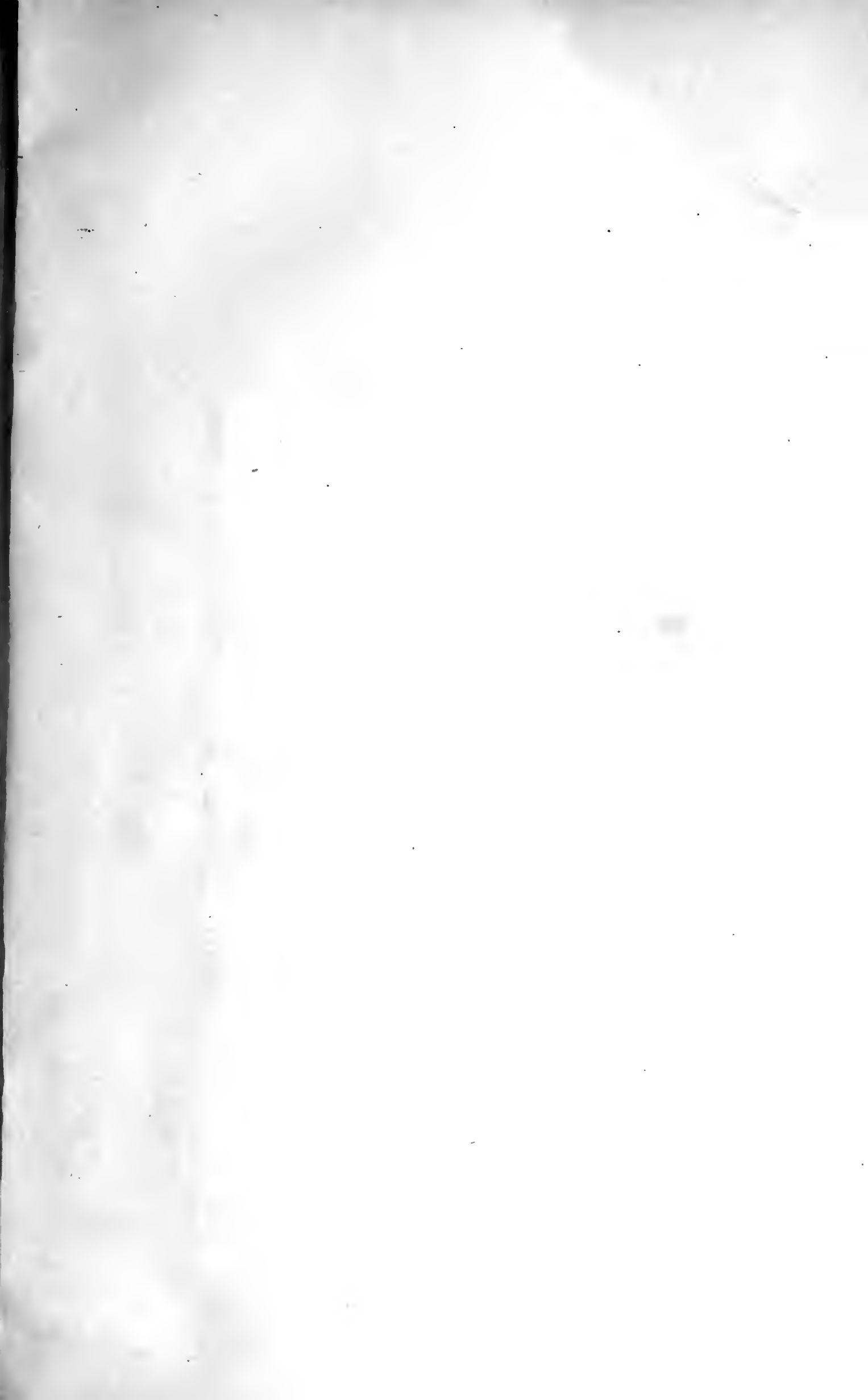
	PAGE.
.....y of operations in Cariboo	632
Summit Camp (Grand Forks)	761
Summit Camp (Tulameen River)	742
<i>Summit Lode</i>	678
<i>Summit No. 1 and No. 2</i>	742
Sunderland Channel	808
<i>Sunlight</i>	737
<i>Sunrise</i>	741
<i>Sunset</i> (Similkameen)	741
<i>Sunset Group</i> (Kettle River)	767
<i>Sunset Group</i> (Nanaimo)	807
<i>Sunset Group</i> (Scott Creek)	676
<i>Sunset Group</i> (Woodberry Creek)	700
Sunset No. 2 Mine (Trail)	717
Sunshine, Ltd	681
<i>Superb Group</i>	793
<i>Superior</i>	700
<i>Surprise</i> (<i>Elkhorn Group</i>)	775
<i>Surprise Group</i> (Trout Lake)	683
Surprise Lake	646
<i>Susie Group</i>	684
Sutherland Hydraulic Gold Mining Co., The	626
<i>Sutter</i>	742
<i>Svengali</i>	708
<i>Swansea</i> (Osoyoos)	775
<i>Swansea</i> (Windermere)	668

T.

Tables of Mineral Production. (*See* Mineral Production).

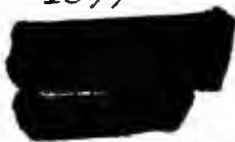
Of Accidents in Coal Mines. (*See* Accidents in Collieries).

<i>Tacoma</i>	789
Taku Lake and Arm	648, 649
<i>Tamarac</i>	689
Tamarac Creek	661
<i>Tam O'Shanter</i>	699
<i>Tangier Group</i>	671
<i>Tariff</i>	697, 707
<i>Tecumseh</i>	701
<i>Teddy S</i>	708
<i>Telkwa</i>	657
Telkwa River	657
Tellurium	560
<i>Tenderfoot</i>	737, 738
Tenderfoot Creek	686, 687
Ten-Mile Creek (Slocan)	690
Ten-Mile Creek (Kamloops)	734
TESLIN LAKE MINING DIVISION (<i>Cassiar District</i>)	571
Tete Jaune Cache (Donald)	664
Tete Jaune Cache (Cariboo)	614
Texada Island	800, 802, 808
Texada (town)	806
<i>Thelma Group</i> (McRae Creek)	675
<i>Thelma Group</i> (West Coast)	793
Theodosia Arm	808
<i>Thistle Group</i>	778, 779
Thompson River	735, 745
<i>Three Jays Claims</i>	780, 781
Three One (3. 1)	760



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